This document gives pertinent information concerning the issuance of the VPDES Permit listed below. This permit is being processed as a Minor, Industrial permit. The discharge will result from the industrial wastewaters generated by the operation of a proposed 20 MGD water treatment plant. This permit action consists of establishing the proposed effluent limits to reflect the current Virginia WQS (effective January 6, 2011) and establishing permit language as appropriate. The effluent limitations and special conditions contained in this permit will maintain the Water Quality Standards of 9VAC25-260-00 et seq.

1. Facility Name and Mailing Address: Loudoun WTP, 44865 Loudoun Water Way, P.O. Box 4000, Ashburn, VA 20146 — SIC Code: 4941 WTP

   Facility Location: Parcel is west and adjacent to Goose Creek Reservoir and on the north side of the Dulles Greenway — County: Loudoun

   Facility Contact Name: Ryan Bucceri — Telephone Number: (571) 291-7981

   Facility Contact Title: Potomac Water Supply Program Manager

   Facility E-mail Address: RBucceri@loudounwater.org

2. Permit No.: VA0092754 — Expiration Date of previous permit: Not Applicable (NA)

   Other VPDES Permits associated with this facility: None

   Other Permits associated with this facility: US Army Corps of Engineers JPA Permit 2010-1844 VWP Permit 10-2020

   E2/E3/E4 Status: Not Applicable (NA)

3. Owner Name: Loudoun Water

   Owner Contact: Ryan Bucceri — Telephone Number: (571) 291-7981

   Owner E-mail Address: RBucceri@loudounwater.org

4. Application Complete Date: February 26, 2013

   Permit Drafted By: Alison Thompson — Date Drafted: March 27, 2013

   Date Revised: July 17, 2013

   Draft Permit Reviewed By: Joan Crowther — Date Reviewed: June 5, 2013

   WPM Review By: Bryant Thomas — Date Reviewed: June 11, 2013

   Public Comment Period: Start Date: August 21, 2013 — End Date: September 21, 2013

5. Receiving Waters Information:

| | | | |
|---|---|---|---|
| Receiving Stream Name: | Goose Creek Reservoir, UT | Stream Code: | 1aXMM |
| Drainage Area at Outfall: | 0.005 sq.mi.* | River Mile: | 0.18 |
| Stream Basin: | Potomac | Subbasin: | Potomac |
| Section: | 9a | Stream Class: | III |
| Special Standards: | PWS | Waterbody ID: | VAN-A08R |
| 7Q10 Low Flow: | 0.0 MGD | 7Q10 High Flow: | 0.0 MGD |
| 1Q10 Low Flow: | 0.0 MGD | 1Q10 High Flow: | 0.0 MGD |
| 30Q10 Low Flow: | 0.0 MGD | 30Q10 High Flow: | 0.0 MGD |
| Harmonic Mean Flow: | 0.0 MGD | 30Q5 Flow: | 0.0 MGD |

*It is staff's best professional judgment that all critical flows for this unnamed tributary are zero due to the very small drainage area for the outfall.

6. Statutory or Regulatory Basis for Special Conditions and Effluent Limitations:

| | | | |
|---|---|---|---|
| ✓ | State Water Control Law | ✓ | EPA Guidelines |
| ✓ | Clean Water Act | ✓ | Water Quality Standards |
| ✓ | VPDES Permit Regulation | ✓ | Other (9VAC25-860 General Permit for Potable Water Treatment Plants) |
| ✓ | EPA NPDES Regulation | | |

7. Licensed Operator Requirements: None

8. Reliability Class: NA

9. Permit Characterization:

| | | | | | |
|---|---|---|---|---|---|
| | Private | ✓ | Effluent Limited | | Possible Interstate Effect |
| | Federal | ✓ | Water Quality Limited | | Compliance Schedule Required |
| | State | ✓ | Whole Effluent Toxicity Program Required | | Interim Limits in Permit |
| ✓ | WTP | | Pretreatment Program Required | | Interim Limits in Other Document |
| ✓ | TMDL | | e-DMR Participant | | |

10. **Wastewater Sources and Treatment Description:**

Loudoun Water is in the design phase for a 20 MGD potable water treatment plant. The 50 acre parcel of land is adjacent to the west side of the Goose Creek Reservoir to the north of the Dulles Greenway. The facility does not yet have a street address. The proposed facility will include preoxidation with ozone, rapid mix of chemicals (polyaluminum chloride and coagulant aid polymer), flocculation, sedimentation, intermediate ozonation, filtration and ultraviolet disinfection. Prior to distribution of the finished water hydrofluosilicic acid, orthophosphate, sodium hypochlorite, and ammonium hydroxide will be added.

The facility is designed to primarily recycle all wastewater from the water treatment facilities with some flows, including the domestic wastewater from the plant restrooms, sent to the Broad Run WRF (VA0091383) for treatment. If the facility does discharge through Outfall 001, flows could include backwash water from the filters (dechlorinated with sodium bisulfite), ozone cooling water, clearwell leakage, and clearwell emergency overflow waters. There could also be minor stormwater contributions to the flows to Outfall 001.

Discharge Flows – The application indicated that the flow contributions during this first permit cycle could be 4.0 MGD from Plant Drain/Bypass, 4.0 MGD from Plant Start-up and Commissioning, and <1.0 MGD from process water. This was a total of up to 9.0 MGD. Initially it was unclear what the average daily flow would be from this facility, since according to Loudoun Water, it is their intention to recycle most of the industrial wastewater flows from the water treatment plant. In email correspondence dated July 16, 2013, Loudoun Water indicated that the average daily flow from this facility once it is operational will be 0.33 MGD (0.25 MGD from the Thickener Decant Water and 0.08 MGD from Clearwell Leakage.) This value shall be used for purposes of establishing the solids WLA for the Benthic TMDL. See Section 15.b for further discussion on the TMDL and the assigned WLA.

See Attachment 1 for the NPDES Permit Rating Worksheet.
See Attachment 2 for a facility schematic for the proposed WTP and a description of the proposed facility.

| TABLE 1 – Outfall Description | | | | |
|---|---|---|---|---|
| **Outfall Number** | **Discharge Sources** | **Treatment** | **Average Daily Flow** | **Outfall Latitude and Longitude** |
| 001 | Industrial Wastewater/Stormwater | See Item 10 above. | 0.33 MGD | **39° 02' 52" N**<br>**77° 32' 00" W** |
| See Attachment 3 for (Leesburg Quad, DEQ #215D) topographic map. | | | | |

**11. Solids Treatment and Disposal Methods:**

Loudoun WTP is an industrial facility that produces potable water. The facility does not produce sewage sludge and does not treat domestic sewage. Solids produced from the production of the potable water will be hauled by a contractor for off-site disposal.

**12. Discharges, Intakes, Monitoring Stations, Other Items in Vicinity of Discharge**

| TABLE 2 | |
|---|---|
| 1aGOO002.38 | DEQ ambient and biological monitoring station located at the Route 7 Bridge |
| Goose Creek Intake | Drinking water intake for the City of Fairfax is located approximately 0.75 rivermiles downstream from the outfall of this facility. |

**13. Material Storage:**

This facility is not yet constructed, so there are no chemicals stored onsite at this time.

**14. Site Inspection:**

Performed by Alison Thompson on May 15, 2013 (Attachment 4).

**15. Receiving Stream Water Quality and Water Quality Standards:**

a) Ambient Water Quality Data

There is no monitoring data for the receiving stream (Goose Creek Reservoir, Unnamed Tributary (UT) 1aXMM). The nearest downstream DEQ ambient and biological monitoring station is 1aGOO002.38, located at the Route 7 Bridge crossing, approximately 3.5 miles downstream of Outfall 001. The following is the water quality summary for this portion of the Potomac River, as taken from the Draft 2012 Integrated Report*:

> Biological monitoring finds benthic macroinvertebrate impairments, resulting in an impaired classification for the aquatic life use. A benthic TMDL for the Goose Creek watershed has been completed and approved, as well.
>
> The fish consumption use is categorized as impaired due to a Virginia Department of Health, Division of Health Hazards Control, PCB fish consumption advisory. Additionally, there were exceedances of the water quality criterion based tissue screening value (TV) of 300 ppb for mercury (Hg) in smallmouth bass (2004). This exceedance is noted by an observed effect for the fish consumption use.
>
> The recreation and wildlife uses are considered fully supporting.
>
> Note: No data was submitted for the 2012 assessment period to assess the public water supply use.

Evaluation of the public water supply use from the previous assessment will be carried forward, including overall category and assessment documentation. The public water supply use information from the 2010 assessment is as follows: The public water supply use is considered fully supporting. According to Rule 8 of the 2012 Assessment Guidance Manual (11-2007), "fully supporting waters can only be carried forward as fully supporting for two additional reporting cycles with no new data." 2012 is the first assessment the public water supply use assessment is carried forward.

* Virginia's Draft 2012 Integrated Report (IR) has been through the public comment period and reviewed by EPA. The 2012 IR is currently awaiting final approval.

b) 303(d) Listed Stream Segments and Total Maximum Daily Loads (TMDLs)

TABLE 3 Information on Downstream 303(d) Impairments and TMDLs

| Waterbody Name | Impaired Use | Cause | Distance From Outfall | TMDL completed | WLA | Basis for TMDL | TMDL Schedule |
|---|---|---|---|---|---|---|---|
| *Impairment Information in the 2012 Integrated Report** | | | | | | | |
| Goose Creek Reservoir | Fish Consumption | PCBs in Fish Tissue: VDH Fish Consumption Advisory | 0.18 miles | No | NA | NA | 2018 |
| Goose Creek | Aquatic Life Use | Benthic Macroinvertebrates Pollutant: Sediment | 0.96 miles | Yes | 15.1 tons/ year | TSS Concentration of 30 mg/L and Average Daily Flow of 0.33 MGD# | Completed in 2004 |

* Virginia's Draft 2012 Integrated Report (IR) has been through the public comment period and reviewed by EPA. The 2012 IR is currently awaiting final approval.

# Even though the maximum discharge noted in the application is 9.0 MGD, it is staff's best professional judgment that it was more appropriate to use the average design flow value for calculating the WLA for the TMDL. This flow value was provided by Loudoun Water.

Loudoun WTP is a new facility and did not receive a WLA as part of the Goose Creek Benthic TMDL that was completed and approved by EPA in 2004. The overall wasteload allocation for this TMDL was developed with a reserve allocation designated for future growth, as described in Sections 6.2.1.1 and 6.2.1.2 of the TMDL report. The future growth reserve is available for allocation to new and expanding permits in the watershed on a first-come, first-serve basis, and is tracked as permits are added or terminated within the watershed. The Goose Creek Benthic TMDL was developed with a future growth allocation of 204.7 tons/year TSS. Previous to Loudoun WTP, there were several new permits and facility expansions that used a portion of the future growth allocation, bringing the remaining allocation to 164.6 tons/year TSS. In assigning a WLA to Loudoun WTP, 15.1 tons/year TSS of the future growth allocation is consumed, leaving 149.5 tons/year TSS available for future new permits and facility expansions. There is sufficient future growth in the TMDL to allocate a WLA of 15.1 tons/year TSS for this permit. The assignment of this future growth allocation for the WLA for the Loudoun WTP facility is consistent with the assumptions and requirements of the Goose Creek Benthic TMDL.

The full planning statement is found in Attachment 5.

c) Receiving Stream Water Quality Criteria

Part IX of 9VAC25-260(360-550) designates classes and special standards applicable to defined Virginia river basins and sections. The receiving stream Goose Creek Reservoir, UT, is located within Section 9a of the Potomac River Basin, and classified as a Class III water.

At all times, Class III waters must achieve a dissolved oxygen (D.O.) of 4.0 mg/L or greater, a daily average D.O. of 5.0 mg/L or greater, a temperature that does not exceed 32°C, and maintain a pH of 6.0-9.0 standard units (S.U.).

Attachment 6 details other water quality criteria applicable to the receiving stream.

Ammonia:
The 7Q10 and 1Q10 of the receiving stream are 0.0 MGD. In cases such as this, effluent pH and temperature data may be used to establish the ammonia water quality standard. Since there is no effluent data available, default values were used to establish the ammonia criteria. An annual temperature value of 25°C, a wet season temperature value of 15°C, and a pH value of 7.5 S.U. were used to calculate the ammonia water quality standards. The ammonia water quality standards calculations are shown in Attachment 6.

Metals Criteria:
The Water Quality Criteria for some metals are dependent on the receiving stream's hardness (expressed as mg/L calcium carbonate). Staff guidance suggests using a default hardness value of 50 mg/L $CaCO_3$ for streams east of the Blue Ridge. The hardness-dependent metals criteria in Attachment 6 are based on this default value.

Bacteria Criteria:
The Virginia Water Quality Standards at 9VAC25-260-170 A state that the following criteria shall apply to protect primary recreational uses in surface waters:

1) *E. coli* bacteria per 100 ml of water shall not exceed a monthly geometric mean of the following:

| | Geometric Mean[1] |
|---|---|
| Freshwater *E. coli* (N/100 ml) | 126 |

[1]For a minimum of four weekly samples [taken during any calendar month].

d) Receiving Stream Special Standards

The State Water Control Board's Water Quality Standards, River Basin Section Tables (9VAC25-260-360, 370 and 380) designates the river basins, sections, classes, and special standards for surface waters of the Commonwealth of Virginia. The receiving stream, Goose Creek Reservoir, UT, is located within Section 9a of the Potomac Basin. This section has been designated with a special standard of PWS.

Special Standard PWS designates a public water supply intake. The Board's Water Quality Standards establish numerical standards for specific parameters calculated to protect human health from toxic effects through drinking water and fish consumption. See 9VAC25-260-140 B for applicable criteria.

This proposed discharge is located in the geographic area subject to the policy for Sewage Treatment in the Dulles Area Watershed (Dulles Policy) as contained in 9VAC25-401 et seq.. However, because this proposed discharge will be from the operation of a potable water treatment plant, it is not subject to the regulatory policy.

e) Threatened or Endangered Species

The Virginia DGIF Fish and Wildlife Information System Database was searched on February 13, 2013, for records to determine if there are threatened or endangered species in the vicinity of the discharge. One state threatened species was identified: Green Floater. The limits proposed in this draft permit are protective of the Virginia Water Quality Standards and protect the threatened and endangered species found near the discharge. The printout can be found in Attachment 7.

**16. Antidegradation (9VAC25-260-30):**

All state surface waters are provided one of three levels of antidegradation protection. For Tier 1 or existing use protection, existing uses of the water body and the water quality to protect these uses must be maintained. Tier 2 water bodies have water quality that is better than the water quality standards. Significant lowering of the water quality of Tier 2 waters is not allowed without an evaluation of the economic and social impacts. Tier 3 water bodies are exceptional waters and are so designated by regulatory amendment. The antidegradation policy prohibits new or expanded discharges into exceptional waters.

The receiving stream has been classified as Tier 2 based on the fact that the unnamed tributary which will convey any discharge from the facility discharges into the Goose Creek Reservoir which is a public water supply reservoir for the City of Fairfax. The drinking water intake is located approximately 0.75 rivermiles downstream from the proposed outfall for this facility. No significant degradation to the existing water quality will be allowed. In accordance with current DEQ guidance, no significant lowering of water quality is to occur where permit limits are based on the following:

- The dissolved oxygen in the receiving stream is not lowered more than 0.2 mg/L from the existing levels;
- The pH of the receiving stream is maintained within the range 6.0-9.0 S.U.;
- There is compliance with all temperature criteria applicable to the receiving stream;
- No more than 25% of the unused assimilative capacity is allocated for toxic criteria established for the protection of aquatic life; and
- No more than 10% of the unused assimilative capacity is allocated for criteria for the protection of human health.

The antidegradation policy also prohibits the expansion of mixing zones to Tier 2 waters unless the requirements of 9VAC25-260-30.A.2 are met. The draft permit is not proposing an expansion of the existing mixing zone.

**17. Effluent Screening, Wasteload Allocation, and Effluent Limitation Development:**

To determine water quality-based effluent limitations for a discharge, the suitability of data must first be determined. Data is suitable for analysis if one or more representative data points is equal to or above the quantification level ("QL") and the data represent the exact pollutant being evaluated.

Next, the appropriate Water Quality Standards (WQS) are determined for the pollutants in the effluent. Then, the Wasteload Allocations (WLA) are calculated. In this case since the critical flows 7Q10 and 1Q10 have been determined to be zero, the WLA's are equal to the WQS. The WLA values are then compared with available effluent data to determine the need for effluent limitations. Effluent limitations are needed if the 97th percentile of the daily effluent concentration values is greater than the acute wasteload allocation or if the 97th percentile of the four-day average effluent concentration values is greater than the chronic wasteload allocation. Effluent limitations are based on the most limiting WLA, the required sampling frequency, and statistical characteristics of the effluent data.

a) Effluent Screening:

This is a proposed facility so there is no data available for evaluation. Based on the SIC Code for the discharge, staff believes that an evaluation of Total Residual Chlorine is necessary.

b) Mixing Zones and Wasteload Allocations (WLAs):

Wasteload allocations (WLAs) are calculated for those parameters in the effluent with the reasonable potential to cause an exceedance of water quality criteria. The basic calculation for establishing a WLA is the steady state complete mix equation:

$$WLA = \frac{C_o [ Q_e + ( f ) ( Q_s ) ] - [ ( C_s ) ( f ) ( Q_s ) ]}{Q_e}$$

Where:
- WLA = Wasteload allocation
- $C_o$ = In-stream water quality criteria
- $Q_e$ = Design flow
- $Q_s$ = Critical receiving stream flow (1Q10 for acute aquatic life criteria; 7Q10 for chronic aquatic life criteria; 30Q10 for ammonia criteria; harmonic mean for carcinogen-human health criteria; and 30Q5 for non-carcinogen human health criteria)
- f = Decimal fraction of critical flow
- $C_s$ = Mean background concentration of parameter in the receiving stream.

The water segment receiving the discharge via Outfall 001 is considered to have a 7Q10 and 1Q10 of 0.0 MGD. As such, there is no mixing zone and the WLA is equal to the $C_o$.

Since the receiving stream has been determined to be a Tier II water, staff must also determine antidegradation wasteload allocations (AWLAs). The steady state complete mix equation is used substituting the antidegradation baseline ($C_b$) for the in-stream water quality criteria ($C_o$):

$$AWLA = \frac{C_b ( Q_e + Q_s ) - ( C_s ) ( Q_s )}{Q_e}$$

Where:
- AWLA = Antidegradation-based wasteload allocation
- $C_b$ = In-stream antidegradation baseline concentration
- $Q_e$ = Design flow
- $Q_s$ = Critical receiving stream flow (1Q10 for acute aquatic life criteria; 7Q10 for chronic aquatic life criteria; 30Q10 for ammonia criteria; harmonic mean for carcinogen-human health criteria; and 30Q5 for non-carcinogen human health criteria)
- $C_s$ = Mean background concentration of parameter in the receiving stream.

Calculated AWLAs for the pollutants noted in a. above are presented in Attachment 6.

c) Effluent Limitations Toxic Pollutants, Outfall 001 –

9VAC25-31-220.D. requires limits be imposed where a discharge has a reasonable potential to cause or contribute to an in-stream excursion of water quality criteria. Those parameters with WLAs and AWLAs that are near effluent concentrations are evaluated for limits.

The VPDES Permit Regulation at 9VAC25-31-230.D requires that monthly and weekly average limitations be imposed for continuous discharges from POTWs and monthly average and daily maximum limitations be imposed for all other continuous non-POTW discharges.

1) Total Residual Chlorine:

Chlorine is used for disinfection and is potentially in the discharge. Staff calculated WLAs and AWLAs for TRC using current critical flows. In accordance with current DEQ guidance, staff used a default data point of 0.2 mg/L and the calculated WLAs to derive limits. A monthly average of 0.004 mg/L and a maximum limit of 0.004 mg/L are proposed for this discharge (Attachment 8).

2) Metals/Organics:

There is no data to review for this unbuilt facility. During the first permit term, the facility shall be required to perform expanded effluent testing. The results shall be reviewed during the reissuance of the permit.

d) Effluent Limitations and Monitoring, Outfall 001 – Conventional and Non-Conventional Pollutants

Total Suspended Solids limitations were established for this facility based on best professional judgment. The limits proposed in this draft permit are also consistent with 9VAC25-860 General Virginia Pollutant Discharge Elimination System (VPDES) Permit for Potable Water Treatment Plants.

pH limitations are set at the water quality criteria.

e) Effluent Limitations, Outfall 001 – Federal Effluent Guidelines.

The discharge from this industrial discharge is not currently covered by effluent guidelines established in 40 CFR.

f) Effluent Limitations and Monitoring Summary.

The effluent limitations are presented in the following table. Limits were established for Total Suspended Solids, pH, and Total Residual Chlorine. Flow monitoring is also included.

The limit for Total Suspended Solids is based on Best Professional Judgement.

Sample Type and Frequency are in accordance with the recommendations in the VPDES Permit Manual.

**18. Antibacksliding:**

This is a new issuance; therefore, backsliding does not apply to this issuance.

**19. Effluent Limitations/Monitoring Requirements:**

Maximum Flow of this Industrial Facility is 4.0 MGD. The average daily flow is 0.33 MGD.
Effective Dates: During the period beginning with the permit's effective date and lasting until the expiration date.

| PARAMETER | BASIS FOR LIMITS | DISCHARGE LIMITATIONS | | | | MONITORING REQUIREMENTS | |
|---|---|---|---|---|---|---|---|
| | | Monthly Average | Daily Maximum | Minimum | Maximum | Frequency | Sample Type |
| Flow (MGD) | NA | NL | NA | NA | NL | 1/M | EST |
| pH | 3 | NA | NA | 6.0 s.u. | 9.0 s.u. | 1/M | Grab |
| Total Suspended Solids | 2, 4 | 30 mg/L | NA | NA | 60 mg/L | 1/M | 5G/8H |
| Total Residual Chlorine | 3 | 0.004 mg/L | 0.004 mg/L | NA | NA | 1/M | Grab |
| Acute Toxicity – *C. dubia* ($TU_a$) | 2 | NA | NA | NA | NL | 1/3M | 5G/8H |
| Acute Toxicity – *P. promelas* ($TU_a$) | 2 | NA | NA | NA | NL | 1/3M | 5G/8H |
| Chronic Toxicity – *C. dubia* ($TU_c$) | 2 | NA | NA | NA | NL | 1/3M | 5G/8H |
| Chronic Toxicity – *P. promelas* ($TU_c$) | 2 | NA | NA | NA | NL | 1/3M | 5G/8H |

The basis for the limitations codes are:

1. Federal Effluent Requirements
2. Best Professional Judgement
3. Water Quality Standards
4. 9VAC25-860

*MGD* = Million gallons per day.
*NA* = Not applicable.
*NL* = No limit; monitor and report.
*S.U.* = Standard units.
*EST* = Estimate

*1/M* = Once every month.
*1/3M* = Once every calendar quarter.

5G/8H = 5 Grab/Eight Hour Composite - Consisting of five (5) grab samples collected at hourly intervals until the discharge ceases or five (5) grab samples taken at equal time intervals for the duration of the discharge if the discharge is less than 8 hours in length.

EST = Reported flow is to be based on the technical evaluation of the sources contributing to the discharge.

Grab = An individual sample collected over a period of time not to exceed 15-minutes.

**20. Other Permit Requirements:**

a) Part I.B. of the permit contains quantification levels and compliance reporting instructions. 9VAC25-31-190.L.4.c. requires an arithmetic mean for measurement averaging and 9VAC25-31-220.D. requires limits be imposed where a discharge has a reasonable potential to cause or contribute to an in-stream excursion of water quality criteria. Specific analytical methodologies for toxics are listed in this permit section as well as quantification levels (QLs) necessary to demonstrate compliance with applicable permit limitations or for use in future evaluations to determine if the pollutant has reasonable potential to cause or contribute to a violation. Required averaging methodologies are also specified.

b) Permit Section Part I.C., details the requirements for Whole Effluent Toxicity (WET) Program.

The VPDES Permit Regulation at 9VAC25-31-210 requires monitoring and 9VAC25-31-220.I, requires limitations in the permit to provide for and assure compliance with all applicable requirements of the State Water Control Law and the Clean Water Act. A WET Program is imposed for municipal facilities with a design rate >1.0 MGD, with an approved pretreatment program or required to develop a pretreatment program, or those determined by the Board based on effluent variability, compliance history, IWC, and receiving stream characteristics. DEQ Guidance recommends WET testing for larger WTPs; it is staff's best professional judgment that WET testing should be performed for this effluent since it discharges to a public water supply.

**21. Other Special Conditions:**

a) O&M Manual Requirement. Required by Code of Virginia §62.1-44.19; Sewage Collection and Treatment Regulations, 9VAC25-790; VPDES Permit Regulation, 9VAC25-31-190.E. The permittee shall maintain a current Operations and Maintenance (O&M) Manual. The permittee shall operate the treatment works in accordance with the O&M Manual and shall make the O&M Manual available to Department personnel for review upon request. Any changes in the practices and procedures followed by the permittee shall be documented in the O&M Manual within 90 days of the effective date of the changes. Non-compliance with the O&M Manual shall be deemed a violation of the permit.

b) Notification Levels. The permittee shall notify the Department as soon as they know or have reason to believe:

a. That any activity has occurred or will occur which would result in the discharge, on a routine or frequent basis, of any toxic pollutant which is not limited in this permit, if that discharge will exceed the highest of the following notification levels:

(1) One hundred micrograms per liter;

(2) Two hundred micrograms per liter for acrolein and acrylonitrile; five hundred micrograms per liter for 2,4-dinitrophenol and for 2-methyl-4,6-dinitrophenol; and one milligram per liter for antimony;

(3) Five times the maximum concentration value reported for that pollutant in the permit application; or

(4) The level established by the Board.

b. That any activity has occurred or will occur which would result in any discharge, on a nonroutine or infrequent basis, of a toxic pollutant which is not limited in this permit, if that discharge will exceed the highest of the following notification levels:

(1) Five hundred micrograms per liter;

(2) One milligram per liter for antimony;

(3) Ten times the maximum concentration value reported for that pollutant in the permit application; or

(4) The level established by the Board.

c) Materials Handling/Storage. 9VAC25-31-50 A prohibits the discharge of any wastes into State waters unless authorized by permit. Code of Virginia §62.1-44.16 and §62.1-44.17 authorize the Board to regulate the discharge of industrial waste or other waste.

d) Water Quality Criteria Reopener. The VPDES Permit Regulation at 9VAC25-31-220 D. requires establishment of effluent limitations to ensure attainment/maintenance of receiving stream water quality criteria. Should data collected and submitted for Attachment A of the permit, indicate the need for limits to ensure protection of water quality criteria, the permit may be modified or alternately revoked and reissued to impose such water quality-based limitations.

e) Water Quality Criteria Monitoring. State Water Control Law §62.1-44.21 authorizes the Board to request information needed to determine the discharge's impact on State waters. States are required to review data on discharges to identify actual or potential toxicity problems, or the attainment of water quality goals, according to 40 CFR Part 131, Water Quality Standards, subpart 131.11. To ensure that water quality criteria are maintained, the permittee is required to analyze the facility's effluent for the substances noted in Attachment A of this VPDES permit.

f) TMDL Reopener: This special condition is to allow the permit to reopened if necessary to bring it in compliance with any applicable TMDL that may be developed and approved for the receiving stream.

Permit Section Part II. Part II of the permit contains standard conditions that appear in all VPDES Permits. In general, these standard conditions address the responsibilities of the permittee, reporting requirements, testing procedures and records retention.

**22. Changes to the Permit from the Previously Issued Permit:**

a) Special Conditions:
   1) Not Applicable since this is the issuance of this VPDES permit.

b) Monitoring and Effluent Limitations:
   1) Not Applicable since this is the issuance of this VPDES permit.

**23. Variances/Alternate Limits or Conditions:**

None

**24. Public Notice Information:**

First Public Notice Date: August 21, 2013 Second Public Notice Date: August 28, 2013

Public Notice Information is required by 9VAC25-31-280 B. All pertinent information is on file and may be inspected, and copied by contacting the: DEQ Northern Regional Office, 13901 Crown Court, Woodbridge, VA 22193, Telephone No. (703) 583-3834, Alison.Thompson@deq.virginia.gov. See Attachment 9 for a copy of the public notice document.

Persons may comment in writing or by email to the DEQ on the proposed permit action, and may request a public hearing, during the comment period. Comments shall include the name, address, and telephone number of the writer and of all persons represented by the commenter/requester, and shall contain a complete, concise statement of the factual basis for comments. Only those comments received within this period will be considered. The DEQ may decide to hold a public hearing, including another comment period, if public response is significant and there are substantial, disputed issues relevant to the permit. Requests for public hearings shall state 1) the reason why a hearing is requested; 2) a brief, informal statement regarding the nature and extent of the interest of the requester or of those represented by the requester, including how and to what extent such interest would be directly and adversely affected by the permit; and 3) specific references, where possible, to terms and conditions of the permit with suggested revisions. Following the comment period, the Board will make a determination regarding the proposed permit action. This determination will become effective, unless the DEQ grants a public hearing. Due notice of any public hearing will be given. The public may request an electronic copy of the draft permit and fact sheet or review the draft permit and application at the DEQ Northern Regional Office by appointment.

**25. Additional Comments:**

Previous Board Action(s): This is a proposed facility; therefore, there are no previous Board actions.

Staff Comments: None.

Public Comment:

EPA Checklist: The checklist can be found in Attachment 10.

# NPDES PERMIT RATING WORK SHEET

[X] Regular Addition
[ ] Discretionary Addition
[ ] Score change, but no status Change
[ ] Deletion

VPDES NO. : VA0092754

Facility Name: Loudoun WTP
City / County: Loudoun
Receiving Water: Goose Creek Reservoir, UT
Reach Number: VAN-A08R

*Is this facility a steam electric power plant (sic =4911) with one or more of the following characteristics?*

1. Power output 500 MW or greater (not using a cooling pond/lake)
2. A nuclear power Plant
3. Cooling water discharge greater than 25% of the receiving stream's 7Q10 flow rater

[ ] Yes; score is 600 (stop here) [X] NO; (continue)

*Is this permit for a* municipal separate storm sewer serving a population greater than 100,000?

[ ] YES; score is 700 (stop here)
[X] NO; (continue)

## FACTOR 1: Toxic Pollutant Potential

PCS SIC Code: _____ Primary Sic Code: 4941 Other Sic Codes: _____ _____ _____

Industrial Subcategory Code: 000 (Code 000 if no subcategory)

*Determine the Toxicity potential from Appendix A. Be sure to use the TOTAL toxicity potential column and check one)*

| Toxicity Group | Code | Points | Toxicity Group | Code | Points | Toxicity Group | Code | Points |
|---|---|---|---|---|---|---|---|---|
| [ ] No process waste streams | 0 | 0 | [ ] 3. | 3 | 15 | [X] 7. | 7 | 35 |
| [ ] 1. | 1 | 5 | [ ] 4. | 4 | 20 | [ ] 8. | 8 | 40 |
| [ ] 2. | 2 | 10 | [ ] 5. | 5 | 25 | [ ] 9. | 9 | 45 |
| | | | [ ] 6. | 6 | 30 | [ ] 10. | 10 | 50 |

Code Number Checked: 7

**Total Points Factor 1: 35**

## FACTOR 2: Flow/Stream Flow Volume (Complete either Section A or Section B; check only one)

Section A – Wastewater Flow Only considered

| Wastewater Type (see Instructions) | | | Code | Points |
|---|---|---|---|---|
| Type I: | Flow < 5 MGD | [ ] | 11 | 0 |
| | Flow 5 to 10 MGD | [ ] | 12 | 10 |
| | Flow > 10 to 50 MGD | [ ] | 13 | 20 |
| | Flow > 50 MGD | [ ] | 14 | 30 |
| Type II: | Flow < 1 MGD | [X] | 21 | 10 |
| | Flow 1 to 5 MGD | [ ] | 22 | 20 |
| | Flow > 5 to 10 MGD | [ ] | 23 | 30 |
| | Flow > 10 MGD | [ ] | 24 | 50 |
| Type III: | Flow < 1 MGD | [ ] | 31 | 0 |
| | Flow 1 to 5 MGD | [ ] | 32 | 10 |
| | Flow > 5 to 10 MGD | [ ] | 33 | 20 |
| | Flow > 10 MGD | [ ] | 34 | 30 |

Section B – Wastewater and Stream Flow Considered

| Wastewater Type (see Instructions) | Percent of Instream Wastewater Concentration at Receiving Stream Low Flow | | Code | Points |
|---|---|---|---|---|
| Type I/III: | < 10 % | [ ] | 41 | 0 |
| | 10 % to < 50 % | [ ] | 42 | 10 |
| | > 50% | [ ] | 43 | 20 |
| Type II: | < 10 % | [ ] | 51 | 0 |
| | 10 % to < 50 % | [ ] | 52 | 20 |
| | > 50 % | [ ] | 53 | 30 |

Code Checked from Section A or B: A

**Total Points Factor 2: 10**

**NPDES PERMIT RATING WORK SHEET**

## FACTOR 3: Conventional Pollutants

(only when limited by the permit)

A. Oxygen Demanding Pollutants: (check one) ☐ BOD ☐ COD ☐ Other: _____

| Permit Limits: (check one) | Code | Points |
|---|---|---|
| ☐ < 100 lbs/day | 1 | 0 |
| ☐ 100 to 1000 lbs/day | 2 | 5 |
| ☐ > 1000 to 3000 lbs/day | 3 | 15 |
| ☐ > 3000 lbs/day | 4 | 20 |

Code Number Checked: NA

**Points Scored: 0**

B. Total Suspended Solids (TSS)

| Permit Limits: (check one) | Code | Points |
|---|---|---|
| ☒ < 100 lbs/day | 1 | 0 |
| ☐ 100 to 1000 lbs/day | 2 | 5 |
| ☐ > 1000 to 5000 lbs/day | 3 | 15 |
| ☐ > 5000 lbs/day | 4 | 20 |

Code Number Checked: 1

**Points Scored: 0**

C. Nitrogen Pollutants: (check one) ☐ Ammonia ☐ Other: _____

| Permit Limits: (check one) | *Nitrogen Equivalent* | Code | Points |
|---|---|---|---|
| ☐ | < 300 lbs/day | 1 | 0 |
| ☐ | 300 to 1000 lbs/day | 2 | 5 |
| ☐ | > 1000 to 3000 lbs/day | 3 | 15 |
| ☐ | > 3000 lbs/day | 4 | 20 |

Code Number Checked: NA

**Points Scored: 0**

**Total Points Factor 3: 0**

## FACTOR 4: Public Health Impact

*Is there a public drinking water supply located within 50 miles downstream of the effluent discharge (this include any body of water to which the receiving water is a tributary)? A public drinking water supply may include infiltration galleries, or other methods of conveyance that ultimately get water from the above reference supply.*

☒ YES; (If yes, check toxicity potential number below)

☐ NO; (If no, go to Factor 5)

Determine the *Human Health* potential from Appendix A. Use the same SIC doe and subcategory reference as in Factor 1. (Be sure to use the *Human Health* toxicity group column – check one below)

| Toxicity Group | Code | Points | Toxicity Group | Code | Points | Toxicity Group | Code | Points |
|---|---|---|---|---|---|---|---|---|
| ☐ No process waste streams | 0 | 0 | ☐ 3. | 3 | 0 | ☒ 7. | 7 | 15 |
| ☐ 1. | 1 | 0 | ☐ 4. | 4 | 0 | ☐ 8. | 8 | 20 |
| ☐ 2. | 2 | 0 | ☐ 5. | 5 | 5 | ☐ 9. | 9 | 25 |
| | | | ☐ 6. | 6 | 10 | ☐ 10. | 10 | 30 |

Code Number Checked: 7

**Total Points Factor 4: 15**

**NPDES PERMIT RATING WORK SHEET**

## FACTOR 5: Water Quality Factors

A. *Is (or will) one or more of the effluent discharge limits based on water quality factors of the receiving stream (rather than technology-base federal effluent guidelines, or technology-base state effluent guidelines), or has a wasteload allocation been to the discharge*

| | | Code | Points |
|---|---|---|---|
| [X] | YES | 1 | 10 |
| [ ] | NO | 2 | 0 |

B. *Is the receiving water in compliance with applicable water quality standards for pollutants that are water quality limited in the permit?*

| | | Code | Points |
|---|---|---|---|
| [X] | YES | 1 | 0 |
| [ ] | NO | 2 | 5 |

C. *Does the effluent discharged from this facility exhibit the reasonable potential to violate water quality standards due to whole effluent toxicity?*

| | | Code | Points |
|---|---|---|---|
| [ ] | YES | 1 | 10 |
| [X] | NO | 2 | 0 |

Code Number Checked: A 1 B 1 C 2

**Points Factor 5:** A 10 + B 0 + C 0 = **10**

## FACTOR 6: Proximity to Near Coastal Waters

A. Base Score: Enter flow code here (from factor 2) 21

Check appropriate facility HPRI code (from PCS):

| | HPRI# | Code | HPRI Score |
|---|---|---|---|
| [ ] | 1 | 1 | 20 |
| [ ] | 2 | 2 | 0 |
| [ ] | 3 | 3 | 30 |
| [X] | 4 | 4 | 0 |
| [ ] | 5 | 5 | 20 |

Enter,the multiplication factor that corresponds to the flow code: 0.1

| Flow Code | Multiplication Factor |
|---|---|
| 11, 31, or 41 | 0.00 |
| 12, 32, or 42 | 0.05 |
| 13, 33, or 43 | 0.10 |
| 14 or 34 | 0.15 |
| 21 or 51 | 0.10 |
| 22 or 52 | 0.30 |
| 23 or 53 | 0.60 |
| 24 | 1.00 |

HPRI code checked : 4

Base Score (HPRI Score): 0 X (Multiplication Factor) 0.1 = 0

B. Additional Points – NEP Program

For a facility that has an HPRI code of 3, does the facility discharge to one of the estuaries enrolled in the National Estuary Protection (NEP) program (see instructions) or the Chesapeake Bay?

| | Code | Points |
|---|---|---|
| [ ] | 1 | 10 |
| [X] | 2 | 0 |

C. Additional Points – Great Lakes Area of Concern

For a facility that has an HPRI code of 5, does the facility discharge any of the pollutants of concern into one of the Great Lakes' 31 area's of concern (see instructions)?

| | Code | Points |
|---|---|---|
| [ ] | 1 | 10 |
| [X] | 2 | 0 |

Code Number Checked: A 4 B 2 C 2

**Points Factor 6:** A 0 + B 0 + C 0 = **0**

## NPDES PERMIT RATING WORK SHEET

### SCORE SUMMARY

| Factor | Description | Total Points |
|---|---|---|
| 1 | Toxic Pollutant Potential | 35 |
| 2 | Flows / Streamflow Volume | 10 |
| 3 | Conventional Pollutants | 0 |
| 4 | Public Health Impacts | 15 |
| 5 | Water Quality Factors | 10 |
| 6 | Proximity to Near Coastal Waters | 0 |
| | TOTAL (Factors 1 through 6) | 70 |

S1. Is the total score equal to or grater than 80 ☐ YES; (Facility is a Major) ☒ NO

S2. If the answer to the above questions is no, would you like this facility to be discretionary major?

☒ NO

☐ YES; (Add 500 points to the above score and provide reason below:

Reason: _____

NEW SCORE : 70

OLD SCORE : None

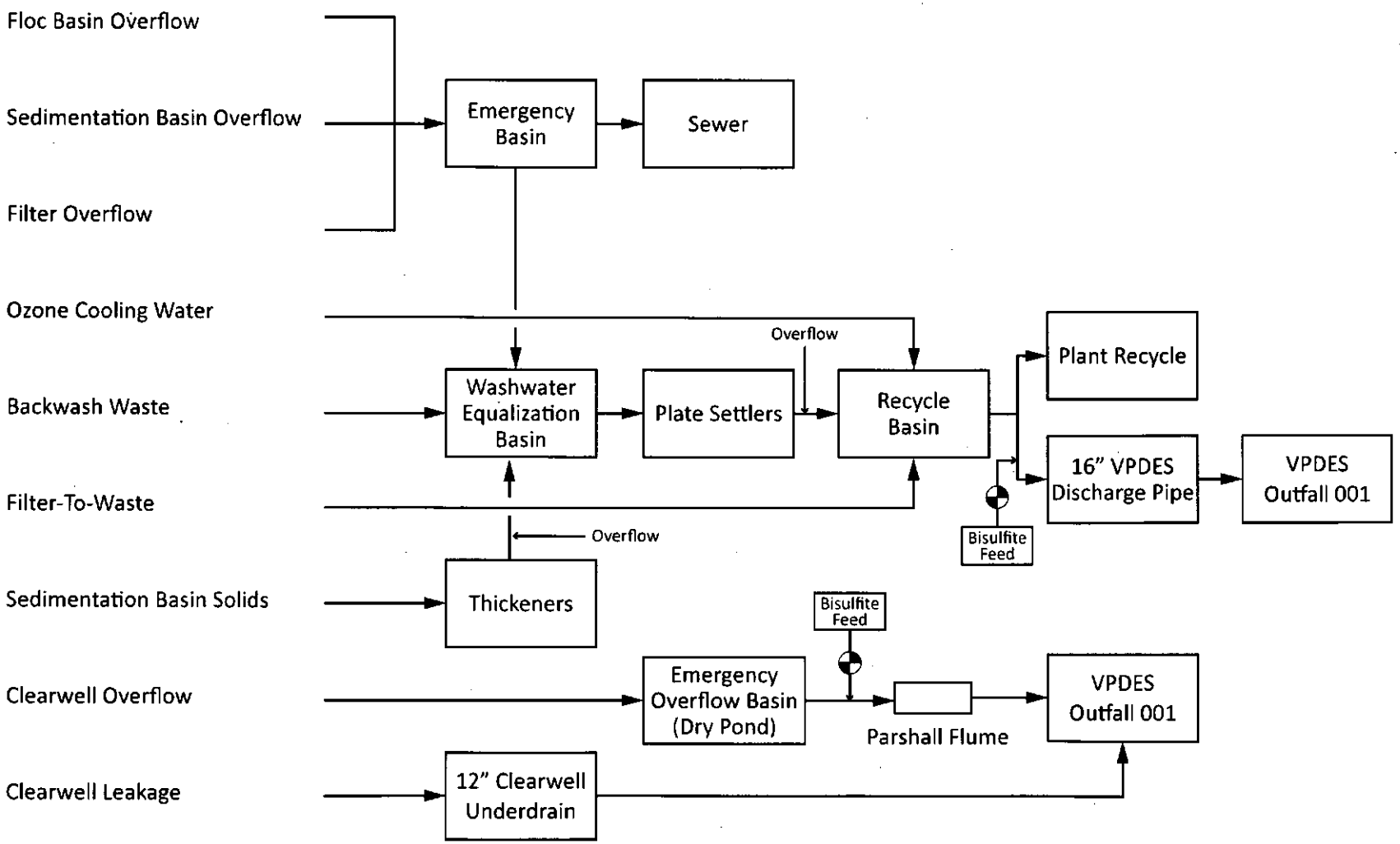
Permit Reviewer's Name : Alison Thompson

Phone Number: (703)583-3834

Date: 3/25/2013

**VPDES Process Flow Schematic**

Flow Sources




Attachment 2

# Appendix B

## Facility Description - Plant Processes

# Loudoun Water Treatment Plant: Facility Description – Plant Processes

## Introduction

The Potomac Water Supply Program (PWSP) will meet the projected net water demand through a phased capacity expansion of the Loudoun Water Treatment Plant (LWTP) and pumping and transmission facilities over a 28-year planning period (through 2040). The plant will start up at a rated Stage 1 capacity of 20 mgd (net capacity for finished water pumped to the distribution system). Plant capacity will be increased incrementally to meet future demands, either through expansion to the Stage 2 capacity of 40 mgd (net), or through uprating to 30 mgd with expansion to 40 mgd deferred to a future date. Uprating of the plant will require one year of full-scale testing and approval by the Virginia Department of Health (VDH). The LWTP will supply Loudoun Water's water distribution system initially through one transmission main extending from the plant to the distribution system.

A unique aspect of the PWSP is the utilization of "water banking" in retired rock quarries. The raw water supply system will allow direct pumping of Potomac River water to existing rock quarries for storage and then use during times of low river flow or adverse water quality conditions. The first quarry is scheduled to be brought online by 2020 and will provide approximately 1 billion gallons of raw water storage for the LWTP. Ultimately, up to four quarries will be available and are planned to provide an estimated eight billion gallons of raw water storage.

As part of the design approach, water quality challenges and trends observed at "benchmark" treatment plants currently in operation along the Potomac River (including Fairfax Water's Corbalis WTP and the Town of Leesburg WTP) were documented and used for development of treatment goals and process train selection for the new plant. Based on this analysis, an ozone-biofiltration treatment process train was selected for the LWTP. This state-of-the-art process train will provide robust treatment for the Potomac River and quarry raw water supplies to meet or surpass minimum requirements of federal and VDH water quality regulations, allow for blending with treated water from Fairfax Water, and produce water of high quality for Loudoun Water's customers in a cost-effective manner.

## Drinking Water Regulations and Treatment Goals

Under the 1996 Safe Drinking Water Act (SDWA) Amendments, the US Environmental Protection Agency (EPA) developed several regulations for public drinking water systems that became effective in the late 1990's and early 2006, which apply to surface water treatment plants and public water distribution systems. These regulations include revisions to the Total Coliform Rule (TCR) and Lead and Copper Rule (LCR) and the following new rules: Interim Enhanced Surface Water Treatment Rule (IESWTR), Stage 1 disinfectants and disinfection byproducts rule (D/DBPR), Stage 2 D/DBPR, the Long Term Stage 1 Enhanced Surface Water Treatment Rule (LT1ESWTR), the Long Term Stage 2 Enhanced Surface Water Treatment Rule

(LT2ESWTR), and the Filter Backwash Recycling Rule (FBRR).

Based on a review of water quality trends for the Potomac River, treatment performance history of the Potomac River benchmark plants, and VDH "optimized" treatment performance criteria, a set of stringent finished water quality goals was adopted for the LWTP, which will allow compliance with all existing and anticipated federal drinking water regulations, and VDH's "optimized" criteria for treatment plants in Virginia. These include Phase 1 goals for design and operation of the new LWTP, and Phase 2 goals that could potentially be adopted for the 40-mgd capacity expansion of the plant, depending on future regulatory compliance requirements, the need to provide advanced treatment for a degraded Potomac River or quarry source water supply, or the desire for improved public health protection.

## Water Quality Trends and Testing

Water quality trends for the Potomac River were characterized by analyzing historical raw water quality for the two benchmark WTPs (Corbalis and Town of Leesburg) for the period 2006 through 2010. The Corbalis WTP intake is located approximately two miles downstream of the proposed intake location for the new LWTP, whereas the Leesburg intake is located just upstream from the new LWTP intake. Table 1-1 presents a summary of routine water quality parameters at the Corbalis intake. A comparison of raw water quality trends for these plants indicate similar water quality characteristics, so it was concluded that historical treatment performance of the ozone-biofiltration train at Corbalis can be used with a high degree of confidence to predict treatment performance at the LWTP.

**Table 1-1**
**Summary of Raw Water Quality Parameters for the Corbalis WTP**

| Parameter[1] | Years 2006 through 2010 | | |
|---|---|---|---|
| | Min | Average[2] | Max |
| Aggressiveness Index No. | 11 | 12 | 13 |
| Alkalinity, mg/L as $CaCO_3$ | 56 | 93 | 128 |
| Aluminum, mg/L | BQL | 0.26 | 0.89 |
| Bromide, mg/L | BQL | 0.03 | 0.06 |
| Chloride, mg/L | 8.7 | 22.1 | 40.3 |
| Hardness, total | 47 | 117 | 175 |
| Iron, mg/L | 0.03 | 0.45 | 2.27 |
| Manganese, mg/L | BQL | 0.04 | 0.26 |
| N, Ammonia, mg/L as N | BQL | 0.01 | 0.24 |
| N, Nitrate, mg/L as N | BQL | 0.9 | 1.7 |
| N, Nitrite, mg/L as N | BQL | 0.01 | 0.03 |
| pH | 7.1 | 7.9 | 8.9 |
| Phosphate as Phosphorous, mg/L | BQL | 0.01 | 0.04 |
| Solids, Total, mg/L | 22 | 207 | 332 |
| Solids, Total Dissolved, mg/L | 16 | 181 | 258 |
| Solids, Total Suspended, mg/L | BQL | 9 | 108 |
| Total Organic Carbon (TOC), mg/L | 2.0 | 3.1 | 6.7 |
| Threshold Odor Number (TON) | 1 | 5 | 12 |
| Turbidity, NTU | 1 | 9 | 55 |

BQL = Below Quantitation Limit
[3] Data from Fairfax Water (http://www.fcwa.org/water/imar.htm). Water Quality Analytical Reports, Corbalis WTP Source Water
[4] Data BQL were treated as zero values for the computation of the average

The key raw water quality parameters for predicting treatment performance at the LWTP and meeting treatment goals include: turbidity, total organic carbon (TOC), alkalinity, pH, and manganese (Mn). These are briefly discussed below.

For the period of 2005 to 2011, turbidity at the Corbalis and Leesburg WTP intakes was highly variable with values ranging from less than 1 NTU to over 100 NTU. Higher values were associated with rainfall events on the Potomac River watershed. The trends between the two intake locations are very similar, with the Corbalis data showing slightly higher turbidity trends. Although the LWTP will be capable of treating high turbidity river water, these trends support the development of an operating rule that the LWTP rely on use of the quarry supply during high turbidity events on the Potomac River to reduce treatment costs.

TOC concentrations were also highly variable at both WTP intakes for the period 2005 to 2010, with values ranging from 2.0 mg/L to 6.7 mg/L. TOC concentrations at the Corbalis intake were typically 0.5 to 1.0 mg/L higher than for the Town of Leesburg intake, and two past excursion events of 6 and 8.65 mg/L for the Corbalis WTP were recorded associated with rainfall events. These findings validate the assertion that finished water quality produced by the ozone-biofiltration train at Corbalis provides a conservative indication of finished water quality that can be expected at the LWTP.

For the period 2005 to 2011, sampling at both WTP intakes indicates highly variable alkalinity and pH values. Alkalinity was documented as ranging from 56 to 128 mg/L, with pH ranging from 7.0 to 9.0 pH units. This variability indicates that pH control for coagulation and final pH adjustment for corrosion control will likely be a treatment challenge for the LWTP. Use of polyaluminum chloride (PACl) as the primary coagulant at the LWTP – which consumes less alkalinity and is less influenced by variable pH than alum – should mitigate potential coagulation chemistry difficulties.

Mn levels from the Leesburg and Corbalis intake locations were evaluated from December 2004 to August 2011. The Mn levels for the Town of Leesburg plant were significantly higher than the Corbalis plant, ranging from less than 0.01 mg/L to greater than 1 mg/L. By comparison, Corbalis Mn levels range from 0.03 mg/L to 0.3 mg/L. It is highly unusual for dissolved Mn levels to approach 1 mg/L; therefore, the difference may be attributed to measurements of total vs. dissolved Mn and the accuracy of the analytical methods used.

Since elevated Mn levels have been observed at both intake locations, bench-scale tests were performed on preoxidation treatment alternatives for Mn oxidation. Based on bench-scale results, an ozone preoxidation process was recommended for the LWTP for enhancing the coagulation process and oxidation of manganese and taste and odor causing compounds. Based on settled water ozonation bench- and full-scale test results, intermediate ozone dose and contact time design values were selected to meet the ozone primary disinfection goal of 1-log *Giardia* inactivation.

## Water Treatment Process Facilities

Loudoun Water completed a desk-top evaluation of treatment process alternatives in September 2009, and performed site visits to several ozone and membrane plants in the mid-Atlantic area in 2009-2010. Based on this information, Loudoun Water concluded that a conventional treatment process train with

ozonation, biological filtration and chloramination should be considered for treating the Potomac River and quarry water supplies. The selection of an ozone-biofiltration process train for the LWTP was made for the following reasons:

- It is capable of meeting all existing drinking water regulations and provides an effective treatment barrier for removing turbidity, particles, microbial pathogens, organics, manganese, algae, taste and odor compounds and several emerging contaminants and pharmaceutical compounds—all relevant water quality issues for the Potomac River.
- It is currently used at Fairfax Water's Corbalis WTP and has proven effective in treating Potomac River water for many years. The same basic train is also used at the Henrico County WTP and has been operating successfully in treating James River water for the past ten years.
- The finished water quality produced by the new plant, with chloramines as a secondary disinfectant, will be comparable to purchased water from Fairfax Water and thus avoid any blended water quality impacts in the Loudoun Water distribution system.
- Bench-scale testing showed that a two-stage ozone treatment process will provide both oxidation and primary disinfection benefits at reasonable ozone doses without formation of chlorinated by-products.

The overall water treatment facility layout and basis of design for unit processes (preoxidation, rapid mixing, flocculation, sedimentation, intermediate ozone, filtration, and UV disinfection), clearwells, and the high service pumping station are briefly discussed below. Complete process schematics detailing the flow of water through the plant and the residuals treatment facility are attached to EPA Application Form 2D.

## Overall Water Treatment Facility Layout

A Consolidated Treatment Complex Layout was selected for the water treatment facility and a Campus Layout for the residuals facility, post-filter clearwells and finished water pumping station. This is considered to be the best design approach for providing a cost-effective, operator-friendly treatment facility that meets both plant site and hydraulic gradeline constraints. The process flow schematic for the LWTP includes multiple unit processes, equipment and chemical application points for improved system reliability and enhanced operational flexibility with no "single point of failure" from the plant head works to the finished water pumping station.

## Ozone Preoxidation

Based on bench-scale testing results, ozone is recommended for preoxidation at a design dose of 2 mg/L and contact time of 5.1 minutes for the Phase 1 design flow (21 mgd), which will be reduced to 2.5 minutes for Phase 2 (42 mgd). For the ozone dissolution system, a sidestream injection system with two redundant flash reactors will be included. This equipment will be housed in the Preozone Injection Building, with two 54-inch pipeline contactors running along the plant site to the Operations Building to provide the required contact time for preoxidation.

## Rapid Mixing

The flash mixing design for the LWTP includes a two-stage mixing system consisting of a pumped injection flash mixing system for the first stage and mechanical vertical turbine mixing system for the second stage. This combination allows for sequential addition of treatment chemicals in either or both mixing stages, with the primary coagulant (polyaluminum chloride) typically introduced in the first flash

mixing stage. The two mixing trains will be sized to meet the Stage 2 design flow of 42 mgd. Both stages are designed to provide fully turbulent mixing.

## Flocculation

The flocculation process for the LWTP consists of three-stages of tapered flocculation in concrete basins equipped with vertical turbine-type flocculators and variable-speed drives to control mixing energy. Eight parallel three-stage flocculation trains will be provided initially, with two trains dedicated to each of four sedimentation basins. The hydraulic detention time at design flow with all basins in service will range from 40.2 minutes for Stage 1 to 20.1 minutes for Stage 2. The velocity gradients range from 40 to 100 $sec^{-1}$ for the three flocculation stages. Each set of two flocculation trains and one sedimentation basin train (four total) can be isolated and removed from service for maintenance by closing the inlet valve on the coagulated water transfer pipeline and the outlet gate for the sedimentation basin. Each flocculation basin can also be isolated and drained independently from the sedimentation basins by closing an inlet valve and outlet gate.

## Sedimentation

The sedimentation process for Stage 1 includes horizontal-flow rectangular sedimentation basins with flight and chain sludge collectors. Four parallel basins will be provided, each sized for a surface loading rate of 0.5 gpm/sft, and hydraulic detention time of 3.3 hours. Full-scale demonstration testing will be required to support rerating the sedimentation basins at potential loading rates of up to 1.0 gpm/sft. In Stage 2, the four sedimentation basins will either be uprated based on successful full-scale demonstration testing at higher loading rates, or retrofitted with inclined plate settlers at the outlet end of the basins. The plate settlers will be designed for a maximum plate loading rate of 1.0 gpm/sft. This equates to a surface overflow rate or projected (planimetric) loading rate of approximately 3.0 gpm/sft.

A flight and chain mechanical sludge collection system will be installed in Stage 1 and will be retained for the Stage 2 capacity expansion. A cross-collector channel and sludge hoppers will be located within the sedimentation basins for sludge storage and transfer by gravity to the residuals facility. Use of a dual sludge collection system at the inlet and outlet ends of the sedimentation basins will allow additional flocculation basins to be built on the inlet side of the basins, if required for increasing flocculation detention time.

## Intermediate Ozonation

The process design criteria for intermediate ozonation was determined based on bench-scale results of ozone demand and decay testing of Potomac River water. An Ozone CT Analysis Model was used to select the optimal combination of ozone dose and hydraulic detention time to meet primary disinfection targets for *Giardia* and virus inactivation. The analysis determined that two contact basins sized for a hydraulic detention time (HDT) of five minutes will meet the 1-log *Giardia* and 2-log virus disinfection targets for both summer and winter design conditions at a reasonable ozone dose (< 2 mg/L). Each contactor will be designed for a longer contact time (10 minutes at future 42 mgd) and will include two passes to allow additional time for the ozone residual to decay below detection limits in cold water, thereby minimizing the need for ozone quenching. Ozone will be introduced into each contactor using a pumped sidestream injection and nozzle manifold dissolution system.

Post-ozone treatment chemicals will be added in a chemical mixing chamber near the outlet of each ozone contactor train using a pumped injection mixing system. An ozone sample gallery is located along the west side of the contacting basins, including five ozone residual sample stations for each train.

A high concentration, oxygen-fed ozone generation system will be implemented to serve both the pre-ozone and intermediate ozone application points. Ozone generation equipment for both preozonation and intermediate ozonation, and ozone dissolution and offgas destruct equipment for intermediate ozonation, are centrally located in the Operations building adjacent to the intermediate ozone contacting basins.

## Biological Filtration

The filtration system for the LWTP is a dual-media gravity filter consisting of 48 inches of granular activated carbon (GAC) over 12 inches of sand and six inches of torpedo sand. Other filter components include: (1) gravel-less nozzle/plenum underdrain system, (2) constant rate/constant head filter control system using an effluent flow control valve and flow meter on each filter, (3) standard fiberglass washwater troughs, (4) electric valve actuators, (5) direct pumped filter backwash system with auxiliary air scour using chloraminated water from the finished water clearwell, and (6) filter-to-waste piping system sized for the same capacity as the filter outlet piping.

For Stage 1, the filters will be rated at 3.8 gpm/sft with one filter offline, slightly below the VDH criterion for high-rate filtration of 4.0 gpm/sft. A total of six filters will be provided, each sized to treat 4.2 mgd with five filters operating at an empty bed contact time (EBCT) of 7.8 minutes. For the Stage 2 capacity expansion, additional filters will be required to meet higher filter loading rates (up to 6 gpm/sft), subject to approval by VDH based on results of full-scale demonstration testing to be performed prior to the expansion. The capability to add hydrogen peroxide to the filter-applied water at a design dose of 1 mg/L will be provided to control head loss accumulation rates across the filters during the summer months when biological activity in the filter beds is maximized.

## UV Disinfection

A post-filter UV system, using medium-pressure (MP) reactors will be planned for possible future implementation as a bid alternate, with the reactors located in the Filter/UV Pipe Gallery of the Filter Building. The UV system will be designed to comply with requirements of USEPA's UV Disinfection Guidance Manual (UVDGM), including off-site validation testing to be completed by the selected UV equipment vendor to determine the reduction equivalent dose (RED) for 3-log *Cryptosporidium* inactivation. Two UV reactors would be provided in Stage 1, each rated at a design flow of 21 mgd or 100% of the Stage 1 design flow. One additional UV reactor would be provided in Stage 2, for a total of three, each rated at 21 mgd or 50% of the Stage 2 design flow.

A preliminary UV transmittance (UVT) design value of 88% was selected for sizing the post-filter UV system based on the 5$^{th}$ percentile of a settled water UVT dataset developed by Fairfax Water for the Corbalis WTP.

## Clearwells

Clearwells provide finished water storage for: (1) supplying peak water demand rates in excess of production rates, (2) supplying washwater for filter backwashing, (3) providing sufficient contact time for primary disinfection (as a back-up to the ozone system), and (4) providing emergency storage to account for plant downtime. To meet the storage needs of the plant, one 2.75 mg circular prestressed concrete cylinder (CPCC) tank will be constructed in Stage 1 for 20 mgd.

The clearwell will include the following features: (1) capability for tank dewatering, (2) sloped roof for drainage, (3) internal baffling, security vents, overflow chambers, access hatches, and (4) exterior finishes to improve tank aesthetics.

### Finished Water Pumping Station and Transmission

The Finished Water Pumping Station is sized for the Stage 2 design flow (40 mgd net), with pumping equipment installed for Stage 1 (20 mgd net). For Stage 1, three vertical turbine can pumps are provided for finished water pumping, each rated at 10 mgd (6,950 gpm) at 360 feet of head with 800 HP motors and variable frequency drives. The Stage 1 operating range of the pumping station is 4 to 20 mgd, assuming two duty pumps and one standby pump. In addition, three backwash pumps will be provided for filter backwashing operations. The backwash pumps will deliver a high backwash rate of 24.0 mgd and a low rate of 5.5 mgd, assuming two duty and one standby pump.

The overall pump station facility layout includes the Finished Water Pumping Station, Electrical Room, and Standby Generator Room in a linear building arrangement. The pumping station will incorporate an overhead bridge crane with coverage to serve the all finished water pumps and backwash pumps.

A finished water transmission (FWT) main sized at 42 inches in diameter is to be routed from the finished water pumping station to Belmont Ridge Road (Route 659) and will include a tunnel under Goose Creek. The 30-foot minimum easement for the finished water main will accommodate the 42-inch finished water main and a potential 8-inch sanitary force main.

## Chemical Storage and Application

The water treatment chemicals for the ozone-biofiltration process train for the LWTP (excluding liquid oxygen which is considered a component of the ozone unit process) include: (1) sodium hydroxide and sulfuric acid for pH adjustment (2) polyaluminum chloride (PACL) and coagulant aid polymer (CAP) for coagulation; (3) PACL and filter aid polymer (FAP) for filter optimization (particle removal); (4) hydrofluosilicic acid for dental hygiene; (5) orthophosphate for corrosion control; (6) sodium hypochlorite and ammonium hydroxide for chloramination; (7) hydrogen peroxide for improved filtration (extended filter runs) and ozone quenching; (8) calcium thiosulfate (CATs) for de-chlorination; and (9) solids thickening polymer for residuals thickening.

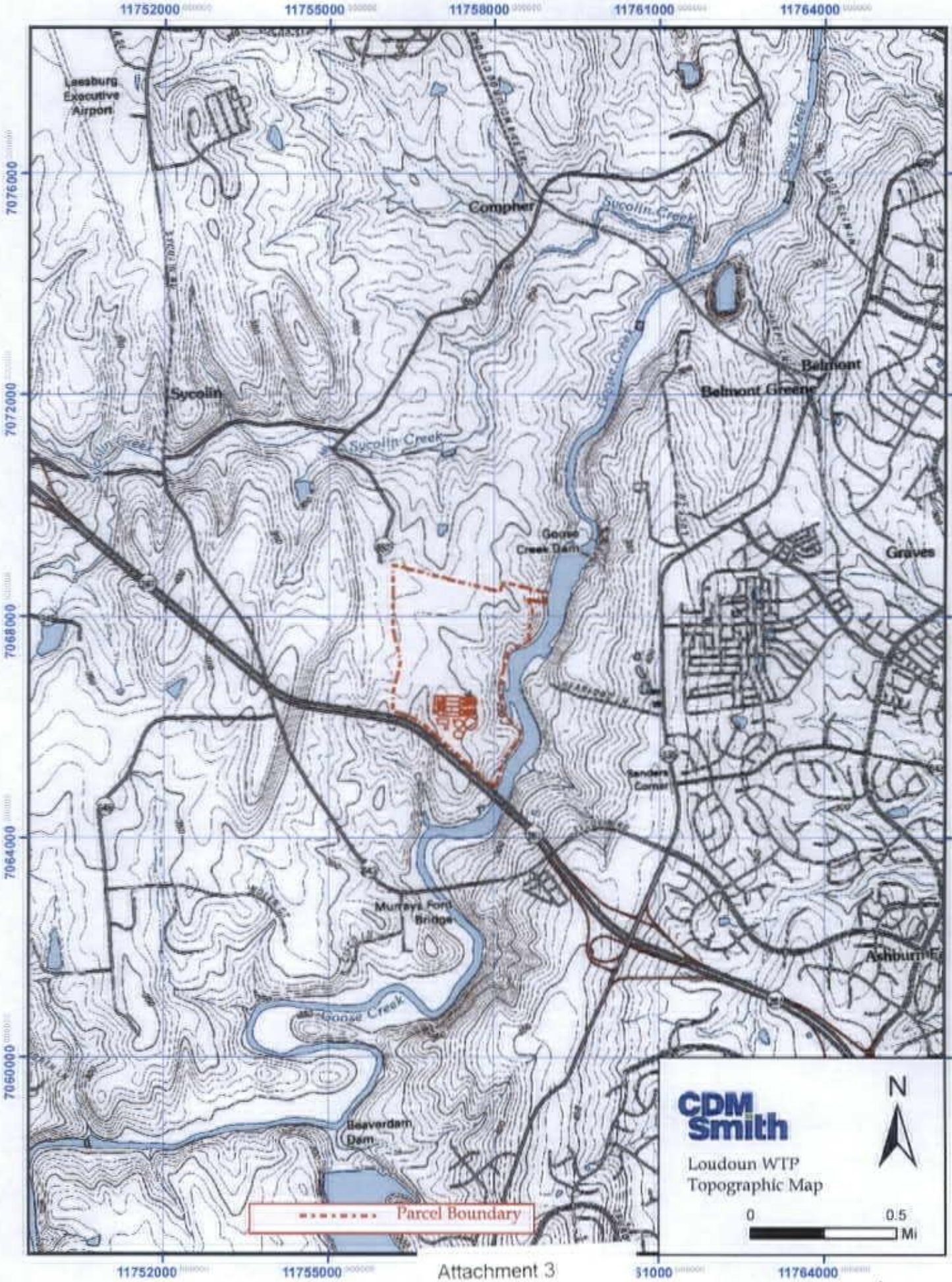
Most chemicals, with the exception of polymer totes, will be delivered as liquids by tanker trucks and off-loaded by pumping into bulk storage tanks. All liquid chemicals will be stored in the Chemical Building in separated containment areas equipped with storage tanks and feed pumps.

The primary chemical application points for the LWTP are located throughout the water treatment facility and include: (1) preozone flash reactor and pipeline contactor for ozone and pH adjustment chemicals; (2) first-stage pumped injection rapid mixer for PACL and CAP; (3) second-stage mechanical rapid mixer for PAC, CAP, and pH adjustment chemicals; (4) intermediate ozone nozzle manifold and contactor for ozone; (5) post-ozone pumped injection system for PACL, FAP, and hydrogen peroxide; (6) post-filter pumped injection system for sodium hypochlorite; (7) filter control weir for ammonia; and (8) post-clearwell pumped injection for fluoride and orthophosphate. Each application point will be provided with a pumped, mechanical or hydraulic mixing device to provide fully turbulent, homogenous mixing to minimize chemical consumption and optimize treatment performance.

## Solids Handling

Dry solids production for the LWTP was estimated based on raw water turbidity trends for the Leesburg WTP and coagulant and polymer doses for Fairfax Water's Corbalis WTP for the period 2007 through 2009. The impact of the future quarry supply on reducing plant solids production during turbidity excursion events in the Potomac River was also evaluated. Based on this analysis, a 95th percentile solids production rate of 7,043 dry lb/day—which accounts for use of the quarry supply when Potomac River turbidity exceeds 50 NTU—is recommended for sizing the Stage 1 residuals treatment processes. The discharge rates for several liquid solids waste streams for Stage 1 were estimated as follows: (1) spent filter backwash water (SFBW)—1.8 mgd (2) filter-to-waste—0.26 mgd, (3) sedimentation basin blowdown—0.28 mgd.

The recommended residuals facility design for Stage 1 includes equalization, clarification and thickening of SFBW and gravity thickening of sedimentation basin residuals. Thickened solids will be removed from site by a truck hauling contractor for off-site disposal. The 42 mgd expansion of the residuals handling facilities (Stage 2) will include the additional SFBW clarification capacity, new thickeners and a new mechanical dewatering facility.




Attachment 3

Photos from the site inspection on May 15, 2013 for the proposed Loudoun Water Treatment Plant (WTP).

Present at the site inspection: Alison Thompson – DEQ-NRO, Nicolle Boulay – Loudoun Water, Matt Petty – CDM Smith

Approximate location of Outfall 001 for the proposed Loudoun WTP. The channel is well defined with large rocks and boulders in the unnamed tributary.

Immediate downstream channel from Outfall 001. During construction of the WTP, rip rap will be added to the channel to prevent erosion.

| | |
|---|---|
|  | The unnamed tributary about half way to the Goose Creek Reservoir. This is the point where another unnamed tributary and the tributary for Outfall 001 merge. |
|  | The unnamed tributary where it enters the emergent wetlands on the shore of the Goose Creek Reservoir. |

| | |
|---|---|
|  | The emergent wetlands. |
| | |
|  | Looking downstream from the emergent wetlands. The main channel of Goose Creek Reservoir can be seen on the other side of the treeline. |
| | |

| | |
|---|---|
| To: | Alison Thompson |
| From: | Katie Conaway/Jennifer Carlson |
| Date: | July 17, 2013 |
| Subject: | Planning Statement for Loudoun WTP |
| Permit Number: | ***No permit number assigned yet – new facility*** |

**Information for Outfall 001:**

| | |
|---|---|
| Discharge Type: | Industrial |
| Discharge Flow: | 9.0 MGD max |
| Receiving Stream: | Unnamed Tributary to the Goose Creek Reservoir |
| Latitude / Longitude: | 39° 02' 52" / -77° 32' 00" |
| Rivermile: | 000.18 |
| Streamcode: | 1aXMM |
| Waterbody: | VAN-A08R |
| Water Quality Standards: | Class III, Section 9a, Special Std PWS |
| Drainage Area: | 0.005 $mi^2$ |

1. Please provide water quality monitoring information for the receiving stream segment. If there is not monitoring information for the receiving stream segment, please provide information on the nearest downstream monitoring station, including how far downstream the monitoring station is from the outfall.

   There is no monitoring data for the receiving stream (Unnamed Tributary 1aXMM). The nearest downstream DEQ monitoring station is 1aGOO002.38, located at the Route 7 bridge crossing, approximately 3.5 miles downstream of Outfall 001. The following is the water quality summary for this portion of Goose Creek, as taken from the Draft 2012 Integrated Assessment*:

   *Class III, Section 8, special stds. PWS.*

   *The following are the DEQ ambient monitoring stations located on Goose Creek:*

   - *1aGOO002.38, at Route 7*

   *Biological monitoring finds benthic macroinvertebrate impairments, resulting in an impaired classification for the aquatic life use. A benthic TMDL for the Goose Creek watershed has been completed and approved, as well.*

   *The fish consumption use is categorized as impaired due to a Virginia Department of Health, Division of Health Hazards Control, PCB fish consumption advisory. Additionally, there were exceedances of the water quality criterion based tissue screening value (TV) of 300 ppb for mercury (Hg) in smallmouth bass (2004). This exceedance is noted by an observed effect for the fish consumption use.*

   *The recreation, public water supply and wildlife uses are considered fully supporting.*

   * Virginia's Draft 2012 Integrated Report (IR) has been through the public comment period and reviewed by EPA. The 2012 IR is currently awaiting final approval.

2. Does this facility discharge to a stream segment on the 303(d) list?

No.

3. Are there any downstream 303(d) listed impairments that are relevant to this discharge?

**Table B. Information on Downstream 303(d) Impairments and TMDLs**

| Waterbody Name | Impaired Use | Cause | Distance From Outfall | TMDL completed | WLA | Basis for WLA | TMDL Schedule |
|---|---|---|---|---|---|---|---|
| ***Impairment Information in the 2012 Integrated Report**** | | | | | | | |
| Goose Creek Reservoir | Fish Consumption | PCBs in Fish Tissue: VDH Fish Consumption Advisory | 0.18 miles | No | N/A | N/A | 2018 |
| Goose Creek | Aquatic Life | Benthic Macroinvertebrates Pollutant: Sediment | 0.96 miles | Goose Creek Benthic 4/26/2004 | 15.1 tons/ year TSS | TSS Concentration of 30 mg/L and Design Flow of 0.33 MGD | --- |

** Virginia's Draft 2012 Integrated Report (IR) has been through the public comment period and reviewed by EPA. The 2012 IR is currently awaiting final approval.*

Loudoun WTP is a new facility and did not receive a WLA as part of the Goose Creek Benthic TMDL that was completed and approved by EPA in 2004. The overall wasteload allocation for this TMDL was developed with a reserve allocation designated for future growth, as described in Sections 6.2.1.1 and 6.2.1.2 of the TMDL report. The future growth reserve is available for allocation to new and expanding permits in the watershed on a first-come, first-serve basis, and is tracked as permits are added or terminated within the watershed. The Goose Creek Benthic TMDL was developed with a future growth allocation of 204.7 tons/year TSS. Previous to Loudoun WTP, there were several new permits and facility expansions that used a portion of the future growth allocation, bringing the remaining allocation to 164.6 tons/year TSS. In assigning a WLA to Loudoun WTP, 15.1 tons/year TSS of the future growth allocation is consumed, leaving 149.5 tons/year TSS available for future new permits and facility expansions. There is sufficient future growth in the TMDL to allocate a WLA of 15.1 tons/year TSS for this permit. The assignment of this future growth allocation for the WLA for the Loudoun WTP facility is consistent with the assumptions and requirements of the Goose Creek Benthic TMDL.

4. Is there monitoring or other conditions that Planning/Assessment needs in the permit?

There is a downstream fish tissue impairment in the Goose Creek Reservoir because of a VDH Health Advisory for PCBs in fish tissue. However, because this is a new facility, DEQ staff has concluded that low-level PCB monitoring is not warranted for this facility.

There is a completed downstream TMDL for the aquatic life use impairment for the Chesapeake Bay. However, the Bay TMDL and the WLAs contained within the TMDL are not addressed in this planning statement.

5. Fact Sheet Requirements – Please provide information regarding any drinking water intakes located within a 5 mile radius of the discharge point.

   There is one drinking water intake (City of Fairfax – Goose Creek Intake) located within a 5 mile radius of this facility. The drinking water intake is located in the lower portion of the Goose Creek Reservoir.

# FRESHWATER
# WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: Loudoun WTP  Permit No.: VA0092754

Receiving Stream: Goose Creek Reservoir, UT  Version: OWP Guidance Memo 00-2011 (8/24/00)

| Stream Information | | Stream Flows | | Mixing Information | | Effluent Information | |
|---|---|---|---|---|---|---|---|
| Mean Hardness (as CaCO3) = | mg/L | 1Q10 (Annual) = | 0 MGD | Annual - 1Q10 Mix = | 100 % | Mean Hardness (as CaCO3) = | 50 mg/L |
| 90% Temperature (Annual) = | deg C | 7Q10 (Annual) = | 0 MGD | - 7Q10 Mix = | 100 % | 90% Temp (Annual) = | 25 deg C |
| 90% Temperature (Wet season) = | deg C | 30Q10 (Annual) = | 0 MGD | - 30Q10 Mix = | 100 % | 90% Temp (Wet season) = | 15 deg C |
| 90% Maximum pH = | SU | 1Q10 (Wet season) = | 0 MGD | Wet Season - 1Q10 Mix = | 100 % | 90% Maximum pH = | 7.5 SU |
| 10% Maximum pH = | SU | 30Q10 (Wet season) | 0 MGD | - 30Q10 Mix = | 100 % | 10% Maximum pH = | SU |
| Tier Designation (1 or 2) = | 2 | 30Q5 = | 0 MGD | | | Discharge Flow = | 0.016 MGD |
| Public Water Supply (PWS) Y/N? = | y | Harmonic Mean = | 0 MGD | | | | |
| Trout Present Y/N? = | n | | | | | | |
| Early Life Stages Present Y/N? = | y | | | | | | |

| Parameter | Background | Water Quality Criteria | | | | Wasteload Allocations | | | | Antidegradation Baseline | | | | Antidegradation Allocations | | | | Most Limiting Allocations | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (ug/l unless noted) | Conc. | Acute | Chronic | HH (PWS) | HH | Acute | Chronic | HH (PWS) | HH | Acute | Chronic | HH (PWS) | HH | Acute | Chronic | HH (PWS) | HH | Acute | Chronic | HH (PWS) | HH |
| Acenapthene | 0 | -- | -- | 6.7E+02 | 9.9E+02 | -- | -- | 6.7E+02 | 9.9E+02 | -- | -- | 6.7E+01 | 9.9E+01 | -- | -- | 6.7E+01 | 9.9E+01 | -- | -- | **6.7E+01** | **9.9E+01** |
| Acrolein | 0 | -- | -- | 6.1E+00 | 9.3E+00 | -- | -- | 6.1E+00 | 9.3E+00 | -- | -- | 6.1E-01 | 9.3E-01 | -- | -- | 6.1E-01 | 9.3E-01 | -- | -- | **6.1E-01** | **9.3E-01** |
| Acrylonitrile [C] | 0 | -- | -- | 5.1E-01 | 2.5E+00 | -- | -- | 5.1E-01 | 2.5E+00 | -- | -- | 5.1E-02 | 2.5E-01 | -- | -- | 5.1E-02 | 2.5E-01 | -- | -- | **5.1E-02** | **2.5E-01** |
| Aldrin [C] | 0 | 3.0E+00 | -- | 4.9E-04 | 5.0E-04 | 3.0E+00 | -- | 4.9E-04 | 5.0E-04 | 7.5E-01 | -- | 4.9E-05 | 5.0E-05 | 7.5E-01 | -- | 4.9E-05 | 5.0E-05 | **7.5E-01** | -- | **4.9E-05** | **5.0E-05** |
| Ammonia-N (mg/l) (Yearly) | 0 | 1.99E+01 | 2.22E+00 | -- | -- | 1.99E+01 | 2.22E+00 | -- | -- | 4.97E+00 | 5.55E-01 | -- | -- | 4.97E+00 | 5.55E-01 | -- | -- | **4.97E+00** | **5.55E-01** | -- | -- |
| Ammonia-N (mg/l) (High Flow) | 0 | 1.99E+01 | 4.23E+00 | -- | -- | 1.99E+01 | 4.23E+00 | -- | -- | 4.97E+00 | 1.06E+00 | -- | -- | 4.97E+00 | 1.06E+00 | -- | -- | **4.97E+00** | **1.06E+00** | -- | -- |
| Anthracene | 0 | -- | -- | 8.3E+03 | 4.0E+04 | -- | -- | 8.3E+03 | 4.0E+04 | -- | -- | 8.3E+02 | 4.0E+03 | -- | -- | 8.3E+02 | 4.0E+03 | -- | -- | **8.3E+02** | **4.0E+03** |
| Antimony | 0 | -- | -- | 5.6E+00 | 6.4E+02 | -- | -- | 5.6E+00 | 6.4E+02 | -- | -- | 5.6E-01 | 6.4E+01 | -- | -- | 5.6E-01 | 6.4E+01 | -- | -- | **5.6E-01** | **6.4E+01** |
| Arsenic | 0 | 3.4E+02 | 1.5E+02 | 1.0E+01 | -- | 3.4E+02 | 1.5E+02 | 1.0E+01 | -- | 8.5E+01 | 3.8E+01 | 1.0E+00 | -- | 8.5E+01 | 3.8E+01 | 1.0E+00 | -- | **8.5E+01** | **3.8E+01** | **1.0E+00** | -- |
| Barium | 0 | -- | -- | 2.0E+03 | -- | -- | -- | 2.0E+03 | -- | -- | -- | 2.0E+02 | -- | -- | -- | 2.0E+02 | -- | -- | -- | **2.0E+02** | -- |
| Benzene [C] | 0 | -- | -- | 2.2E+01 | 5.1E+02 | -- | -- | 2.2E+01 | 5.1E+02 | -- | -- | 2.2E+00 | 5.1E+01 | -- | -- | 2.2E+00 | 5.1E+01 | -- | -- | **2.2E+00** | **5.1E+01** |
| Benzidine [C] | 0 | -- | -- | 8.6E-04 | 2.0E-03 | -- | -- | 8.6E-04 | 2.0E-03 | -- | -- | 8.6E-05 | 2.0E-04 | -- | -- | 8.6E-05 | 2.0E-04 | -- | -- | **8.6E-05** | **2.0E-04** |
| Benzo (a) anthracene [C] | 0 | -- | -- | 3.8E-02 | 1.8E-01 | -- | -- | 3.8E-02 | 1.8E-01 | -- | -- | 3.8E-03 | 1.8E-02 | -- | -- | 3.8E-03 | 1.8E-02 | -- | -- | **3.8E-03** | **1.8E-02** |
| Benzo (b) fluoranthene [C] | 0 | -- | -- | 3.8E-02 | 1.8E-01 | -- | -- | 3.8E-02 | 1.8E-01 | -- | -- | 3.8E-03 | 1.8E-02 | -- | -- | 3.8E-03 | 1.8E-02 | -- | -- | **3.8E-03** | **1.8E-02** |
| Benzo (k) fluoranthene [C] | 0 | -- | -- | 3.8E-02 | 1.8E-01 | -- | -- | 3.8E-02 | 1.8E-01 | -- | -- | 3.8E-03 | 1.8E-02 | -- | -- | 3.8E-03 | 1.8E-02 | -- | -- | **3.8E-03** | **1.8E-02** |
| Benzo (a) pyrene [C] | 0 | -- | -- | 3.8E-02 | 1.8E-01 | -- | -- | 3.8E-02 | 1.8E-01 | -- | -- | 3.8E-03 | 1.8E-02 | -- | -- | 3.8E-03 | 1.8E-02 | -- | -- | **3.8E-03** | **1.8E-02** |
| Bis2-Chloroethyl Ether [C] | 0 | -- | -- | 3.0E-01 | 5.3E+00 | -- | -- | 3.0E-01 | 5.3E+00 | -- | -- | 3.0E-02 | 5.3E-01 | -- | -- | 3.0E-02 | 5.3E-01 | -- | -- | **3.0E-02** | **5.3E-01** |
| Bis2-Chloroisopropyl Ether | 0 | -- | -- | 1.4E+03 | 6.5E+04 | -- | -- | 1.4E+03 | 6.5E+04 | -- | -- | 1.4E+02 | 6.5E+03 | -- | -- | 1.4E+02 | 6.5E+03 | -- | -- | **1.4E+02** | **6.5E+03** |
| Bis 2-Ethylhexyl Phthalate [C] | 0 | -- | -- | 1.2E+01 | 2.2E+01 | -- | -- | 1.2E+01 | 2.2E+01 | -- | -- | 1.2E+00 | 2.2E+00 | -- | -- | 1.2E+00 | 2.2E+00 | -- | -- | **1.2E+00** | **2.2E+00** |
| Bromoform [C] | 0 | -- | -- | 4.3E+01 | 1.4E+03 | -- | -- | 4.3E+01 | 1.4E+03 | -- | -- | 4.3E+00 | 1.4E+02 | -- | -- | 4.3E+00 | 1.4E+02 | -- | -- | **4.3E+00** | **1.4E+02** |
| Butylbenzylphthalate | 0 | -- | -- | 1.5E+03 | 1.9E+03 | -- | -- | 1.5E+03 | 1.9E+03 | -- | -- | 1.5E+02 | 1.9E+02 | -- | -- | 1.5E+02 | 1.9E+02 | -- | -- | **1.5E+02** | **1.9E+02** |
| Cadmium | 0 | 1.8E+00 | 6.6E-01 | 5.0E+00 | -- | 1.8E+00 | 6.6E-01 | 5.0E+00 | -- | 4.5E-01 | 1.6E-01 | 5.0E-01 | -- | 4.5E-01 | 1.6E-01 | 5.0E-01 | -- | **4.5E-01** | **1.6E-01** | **5.0E-01** | -- |
| Carbon Tetrachloride [C] | 0 | -- | -- | 2.3E+00 | 1.6E+01 | -- | -- | 2.3E+00 | 1.6E+01 | -- | -- | 2.3E-01 | 1.6E+00 | -- | -- | 2.3E-01 | 1.6E+00 | -- | -- | **2.3E-01** | **1.6E+00** |
| Chlordane [C] | 0 | 2.4E+00 | 4.3E-03 | 8.0E-03 | 8.1E-03 | 2.4E+00 | 4.3E-03 | 8.0E-03 | 8.1E-03 | 6.0E-01 | 1.1E-03 | 8.0E-04 | 8.1E-04 | 6.0E-01 | 1.1E-03 | 8.0E-04 | 8.1E-04 | **6.0E-01** | **1.1E-03** | **8.0E-04** | **8.1E-04** |
| Chloride | 0 | 8.6E+05 | 2.3E+05 | 2.5E+05 | -- | 8.6E+05 | 2.3E+05 | 2.5E+05 | -- | 2.2E+05 | 5.8E+04 | 2.5E+04 | -- | 2.2E+05 | 5.8E+04 | 2.5E+04 | -- | **2.2E+05** | **5.8E+04** | **2.5E+04** | -- |
| TRC | 0 | 1.9E+01 | 1.1E+01 | -- | -- | 1.9E+01 | 1.1E+01 | -- | -- | 4.8E+00 | 2.8E+00 | -- | -- | 4.8E+00 | 2.8E+00 | -- | -- | **4.8E+00** | **2.8E+00** | -- | -- |
| Chlorobenzene | 0 | -- | -- | 1.3E+02 | 1.6E+03 | -- | -- | 1.3E+02 | 1.6E+03 | -- | -- | 1.3E+01 | 1.6E+02 | -- | -- | 1.3E+01 | 1.6E+02 | -- | -- | **1.3E+01** | **1.6E+02** |



Attachment 6

| Parameter | Background | Water Quality Criteria | | | | Wasteload Allocations | | | | Antidegradation Baseline | | | | Antidegradation Allocations | | | | Most Limiting Allocations | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (ug/l unless noted) | Conc | Acute | Chronic | HH (PWS) | HH | Acute | Chronic | HH (PWS) | HH | Acute | Chronic | HH (PWS) | HH | Acute | Chronic | HH (PWS) | HH | Acute | Chronic | HH (PWS) | HH |
| Chlorodibromomethane[C] | 0 | -- | -- | 4.0E+00 | 1.3E+02 | -- | -- | 4.0E+00 | 1.3E+02 | -- | -- | 4.0E-01 | 1.3E+01 | -- | -- | 4.0E-01 | 1.3E+01 | -- | -- | **4.0E-01** | **1.3E+01** |
| Chloroform | 0 | -- | -- | 3.4E+02 | 1.1E+04 | -- | -- | 3.4E+02 | 1.1E+04 | -- | -- | 3.4E+01 | 1.1E+03 | -- | -- | 3.4E+01 | 1.1E+03 | -- | -- | **3.4E+01** | **1.1E+03** |
| 2-Chloronaphthalene | 0 | -- | -- | 1.0E+03 | 1.6E+03 | -- | -- | 1.0E+03 | 1.6E+03 | -- | -- | 1.0E+02 | 1.6E+02 | -- | -- | 1.0E+02 | 1.6E+02 | -- | -- | **1.0E+02** | **1.6E+02** |
| 2-Chlorophenol | 0 | -- | -- | 8.1E+01 | 1.5E+02 | -- | -- | 8.1E+01 | 1.5E+02 | -- | -- | 8.1E+00 | 1.5E+01 | -- | -- | 8.1E+00 | 1.5E+01 | -- | -- | **8.1E+00** | **1.5E+01** |
| Chlorpyrifos | 0 | 8.3E-02 | 4.1E-02 | -- | -- | 8.3E-02 | 4.1E-02 | -- | -- | 2.1E-02 | 1.0E-02 | -- | -- | 2.1E-02 | 1.0E-02 | -- | -- | **2.1E-02** | **1.0E-02** | -- | -- |
| Chromium III | 0 | 3.2E+02 | 4.2E+01 | -- | -- | 3.2E+02 | 4.2E+01 | -- | -- | 8.1E+01 | 1.1E+01 | -- | -- | 8.1E+01 | 1.1E+01 | -- | -- | **8.1E+01** | **1.1E+01** | -- | -- |
| Chromium VI | 0 | 1.6E+01 | 1.1E+01 | -- | -- | 1.6E+01 | 1.1E+01 | -- | -- | 4.0E+00 | 2.8E+00 | -- | -- | 4.0E+00 | 2.8E+00 | -- | -- | **4.0E+00** | **2.8E+00** | -- | -- |
| Chromium, Total | 0 | -- | -- | 1.0E+02 | -- | -- | -- | 1.0E+02 | -- | -- | -- | 1.0E+01 | -- | -- | -- | 1.0E+01 | -- | -- | -- | **1.0E+01** | -- |
| Chrysene[C] | 0 | -- | -- | 3.8E-03 | 1.8E-02 | -- | -- | 3.8E-03 | 1.8E-02 | -- | -- | 3.8E-04 | 1.8E-03 | -- | -- | 3.8E-04 | 1.8E-03 | -- | -- | **3.8E-04** | **1.8E-03** |
| Copper | 0 | 7.0E+00 | 5.0E+00 | 1.3E+03 | -- | 7.0E+00 | 5.0E+00 | 1.3E+03 | -- | 1.7E+00 | 1.2E+00 | 1.3E+02 | -- | 1.7E+00 | 1.2E+00 | 1.3E+02 | -- | **1.7E+00** | **1.2E+00** | **1.3E+02** | -- |
| Cyanide, Free | 0 | 2.2E+01 | 5.2E+00 | 1.4E+02 | 1.6E+04 | 2.2E+01 | 5.2E+00 | 1.4E+02 | 1.6E+04 | 5.5E+00 | 1.3E+00 | 1.4E+01 | 1.6E+03 | 5.5E+00 | 1.3E+00 | 1.4E+01 | 1.6E+03 | **5.5E+00** | **1.3E+00** | **1.4E+01** | **1.6E+03** |
| DDD[C] | 0 | -- | -- | 3.1E-03 | 3.1E-03 | -- | -- | 3.1E-03 | 3.1E-03 | -- | -- | 3.1E-04 | 3.1E-04 | -- | -- | 3.1E-04 | 3.1E-04 | -- | -- | **3.1E-04** | **3.1E-04** |
| DDE[C] | 0 | -- | -- | 2.2E-03 | 2.2E-03 | -- | -- | 2.2E-03 | 2.2E-03 | -- | -- | 2.2E-04 | 2.2E-04 | -- | -- | 2.2E-04 | 2.2E-04 | -- | -- | **2.2E-04** | **2.2E-04** |
| DDT[C] | 0 | 1.1E+00 | 1.0E-03 | 2.2E-03 | 2.2E-03 | 1.1E+00 | 1.0E-03 | 2.2E-03 | 2.2E-03 | 2.8E-01 | 2.5E-04 | 2.2E-04 | 2.2E-04 | 2.8E-01 | 2.5E-04 | 2.2E-04 | 2.2E-04 | **2.8E-01** | **2.5E-04** | **2.2E-04** | **2.2E-04** |
| Demeton | 0 | -- | 1.0E-01 | -- | -- | -- | 1.0E-01 | -- | -- | -- | 2.5E-02 | -- | -- | -- | 2.5E-02 | -- | -- | -- | **2.5E-02** | -- | -- |
| Diazinon | 0 | 1.7E-01 | 1.7E-01 | -- | -- | 1.7E-01 | 1.7E-01 | -- | -- | 4.3E-02 | 4.3E-02 | -- | -- | 4.3E-02 | 4.3E-02 | -- | -- | **4.3E-02** | **4.3E-02** | -- | -- |
| Dibenz(a,h)anthracene[C] | 0 | -- | -- | 3.8E-02 | 1.8E-01 | -- | -- | 3.8E-02 | 1.8E-01 | -- | -- | 3.8E-03 | 1.8E-02 | -- | -- | 3.8E-03 | 1.8E-02 | -- | -- | **3.8E-03** | **1.8E-02** |
| 1,2-Dichlorobenzene | 0 | -- | -- | 4.2E+02 | 1.3E+03 | -- | -- | 4.2E+02 | 1.3E+03 | -- | -- | 4.2E+01 | 1.3E+02 | -- | -- | 4.2E+01 | 1.3E+02 | -- | -- | **4.2E+01** | **1.3E+02** |
| 1,3-Dichlorobenzene | 0 | -- | -- | 3.2E+02 | 9.6E+02 | -- | -- | 3.2E+02 | 9.6E+02 | -- | -- | 3.2E+01 | 9.6E+01 | -- | -- | 3.2E+01 | 9.6E+01 | -- | -- | **3.2E+01** | **9.6E+01** |
| 1,4-Dichlorobenzene | 0 | -- | -- | 6.3E+01 | 1.9E+02 | -- | -- | 6.3E+01 | 1.9E+02 | -- | -- | 6.3E+00 | 1.9E+01 | -- | -- | 6.3E+00 | 1.9E+01 | -- | -- | **6.3E+00** | **1.9E+01** |
| 3,3-Dichlorobenzidine[C] | 0 | -- | -- | 2.1E-01 | 2.8E-01 | -- | -- | 2.1E-01 | 2.8E-01 | -- | -- | 2.1E-02 | 2.8E-02 | -- | -- | 2.1E-02 | 2.8E-02 | -- | -- | **2.1E-02** | **2.8E-02** |
| Dichlorobromomethane[C] | 0 | -- | -- | 5.5E+00 | 1.7E+02 | -- | -- | 5.5E+00 | 1.7E+02 | -- | -- | 5.5E-01 | 1.7E+01 | -- | -- | 5.5E-01 | 1.7E+01 | -- | -- | **5.5E-01** | **1.7E+01** |
| 1,2-Dichloroethane[C] | 0 | -- | -- | 3.8E+00 | 3.7E+02 | -- | -- | 3.8E+00 | 3.7E+02 | -- | -- | 3.8E-01 | 3.7E+01 | -- | -- | 3.8E-01 | 3.7E+01 | -- | -- | **3.8E-01** | **3.7E+01** |
| 1,1-Dichloroethylene | 0 | -- | -- | 3.3E+02 | 7.1E+03 | -- | -- | 3.3E+02 | 7.1E+03 | -- | -- | 3.3E+01 | 7.1E+02 | -- | -- | 3.3E+01 | 7.1E+02 | -- | -- | **3.3E+01** | **7.1E+02** |
| 1,2-trans-dichloroethylene | 0 | -- | -- | 1.4E+02 | 1.0E+04 | -- | -- | 1.4E+02 | 1.0E+04 | -- | -- | 1.4E+01 | 1.0E+03 | -- | -- | 1.4E+01 | 1.0E+03 | -- | -- | **1.4E+01** | **1.0E+03** |
| 2,4-Dichlorophenol | 0 | -- | -- | 7.7E+01 | 2.9E+02 | -- | -- | 7.7E+01 | 2.9E+02 | -- | -- | 7.7E+00 | 2.9E+01 | -- | -- | 7.7E+00 | 2.9E+01 | -- | -- | **7.7E+00** | **2.9E+01** |
| 2,4-Dichlorophenoxy acetic acid (2,4-D) | 0 | -- | -- | 1.0E+02 | -- | -- | -- | 1.0E+02 | -- | -- | -- | 1.0E+01 | -- | -- | -- | 1.0E+01 | -- | -- | -- | **1.0E+01** | -- |
| 1,2-Dichloropropane[C] | 0 | -- | -- | 5.0E+00 | 1.5E+02 | -- | -- | 5.0E+00 | 1.5E+02 | -- | -- | 5.0E-01 | 1.5E+01 | -- | -- | 5.0E-01 | 1.5E+01 | -- | -- | **5.0E-01** | **1.5E+01** |
| 1,3-Dichloropropene[C] | 0 | -- | -- | 3.4E+00 | 2.1E+02 | -- | -- | 3.4E+00 | 2.1E+02 | -- | -- | 3.4E-01 | 2.1E+01 | -- | -- | 3.4E-01 | 2.1E+01 | -- | -- | **3.4E-01** | **2.1E+01** |
| Dieldrin[C] | 0 | 2.4E-01 | 5.6E-02 | 5.2E-04 | 5.4E-04 | 2.4E-01 | 5.6E-02 | 5.2E-04 | 5.4E-04 | 6.0E-02 | 1.4E-02 | 5.2E-05 | 5.4E-05 | 6.0E-02 | 1.4E-02 | 5.2E-05 | 5.4E-05 | **6.0E-02** | **1.4E-02** | **5.2E-05** | **5.4E-05** |
| Diethyl Phthalate | 0 | -- | -- | 1.7E+04 | 4.4E+04 | -- | -- | 1.7E+04 | 4.4E+04 | -- | -- | 1.7E+03 | 4.4E+03 | -- | -- | 1.7E+03 | 4.4E+03 | -- | -- | **1.7E+03** | **4.4E+03** |
| 2,4-Dimethylphenol | 0 | -- | -- | 3.8E+02 | 8.5E+02 | -- | -- | 3.8E+02 | 8.5E+02 | -- | -- | 3.8E+01 | 8.5E+01 | -- | -- | 3.8E+01 | 8.5E+01 | -- | -- | **3.8E+01** | **8.5E+01** |
| Dimethyl Phthalate | 0 | -- | -- | 2.7E+05 | 1.1E+06 | -- | -- | 2.7E+05 | 1.1E+06 | -- | -- | 2.7E+04 | 1.1E+05 | -- | -- | 2.7E+04 | 1.1E+05 | -- | -- | **2.7E+04** | **1.1E+05** |
| Di-n-Butyl Phthalate | 0 | -- | -- | 2.0E+03 | 4.5E+03 | -- | -- | 2.0E+03 | 4.5E+03 | -- | -- | 2.0E+02 | 4.5E+02 | -- | -- | 2.0E+02 | 4.5E+02 | -- | -- | **2.0E+02** | **4.5E+02** |
| 2,4 Dinitrophenol | 0 | -- | -- | 6.9E+01 | 5.3E+03 | -- | -- | 6.9E+01 | 5.3E+03 | -- | -- | 6.9E+00 | 5.3E+02 | -- | -- | 6.9E+00 | 5.3E+02 | -- | -- | **6.9E+00** | **5.3E+02** |
| 2-Methyl-4,6-Dinitrophenol | 0 | -- | -- | 1.3E+01 | 2.8E+02 | -- | -- | 1.3E+01 | 2.8E+02 | -- | -- | 1.3E+00 | 2.8E+01 | -- | -- | 1.3E+00 | 2.8E+01 | -- | -- | **1.3E+00** | **2.8E+01** |
| 2,4-Dinitrotoluene[C] | 0 | -- | -- | 1.1E+00 | 3.4E+01 | -- | -- | 1.1E+00 | 3.4E+01 | -- | -- | 1.1E-01 | 3.4E+00 | -- | -- | 1.1E-01 | 3.4E+00 | -- | -- | **1.1E-01** | **3.4E+00** |
| Dioxin 2,3,7,8-tetrachlorodibenzo-p-dioxin | 0 | -- | -- | 5.0E-08 | 5.1E-08 | -- | -- | 5.0E-08 | 5.1E-08 | -- | -- | 5.0E-09 | 5.1E-09 | -- | -- | 5.0E-09 | 5.1E-09 | -- | -- | **5.0E-09** | **5.1E-09** |
| 1,2-Diphenylhydrazine[C] | 0 | -- | -- | 3.6E-01 | 2.0E+00 | -- | -- | 3.6E-01 | 2.0E+00 | -- | -- | 3.6E-02 | 2.0E-01 | -- | -- | 3.6E-02 | 2.0E-01 | -- | -- | **3.6E-02** | **2.0E-01** |
| Alpha-Endosulfan | 0 | 2.2E-01 | 5.6E-02 | 6.2E+01 | 8.9E+01 | 2.2E-01 | 5.6E-02 | 6.2E+01 | 8.9E+01 | 5.5E-02 | 1.4E-02 | 6.2E+00 | 8.9E+00 | 5.5E-02 | 1.4E-02 | 6.2E+00 | 8.9E+00 | **5.5E-02** | **1.4E-02** | **6.2E+00** | **8.9E+00** |
| Beta-Endosulfan | 0 | 2.2E-01 | 5.6E-02 | 6.2E+01 | 8.9E+01 | 2.2E-01 | 5.6E-02 | 6.2E+01 | 8.9E+01 | 5.5E-02 | 1.4E-02 | 6.2E+00 | 8.9E+00 | 5.5E-02 | 1.4E-02 | 6.2E+00 | 8.9E+00 | **5.5E-02** | **1.4E-02** | **6.2E+00** | **8.9E+00** |
| Alpha + Beta Endosulfan | 0 | 2.2E-01 | 5.6E-02 | -- | -- | 2.2E-01 | 5.6E-02 | -- | -- | 5.5E-02 | 1.4E-02 | -- | -- | 5.5E-02 | 1.4E-02 | -- | -- | **5.5E-02** | **1.4E-02** | -- | -- |
| Endosulfan Sulfate | 0 | -- | -- | 6.2E+01 | 8.9E+01 | -- | -- | 6.2E+01 | 8.9E+01 | -- | -- | 6.2E+00 | 8.9E+00 | -- | -- | 6.2E+00 | 8.9E+00 | -- | -- | **6.2E+00** | **8.9E+00** |
| Endrin | 0 | 8.6E-02 | 3.6E-02 | 5.9E-02 | 6.0E-02 | 8.6E-02 | 3.6E-02 | 5.9E-02 | 6.0E-02 | 2.2E-02 | 9.0E-03 | 5.9E-03 | 6.0E-03 | 2.2E-02 | 9.0E-03 | 5.9E-03 | 6.0E-03 | **2.2E-02** | **9.0E-03** | **5.9E-03** | **6.0E-03** |
| Endrin Aldehyde | 0 | -- | -- | 2.9E-01 | 3.0E-01 | -- | -- | 2.9E-01 | 3.0E-01 | -- | -- | 2.9E-02 | 3.0E-02 | -- | -- | 2.9E-02 | 3.0E-02 | -- | -- | **2.9E-02** | **3.0E-02** |

| Parameter | Background | Water Quality Criteria | | | | Wasteload Allocations | | | | Antidegradation Baseline | | | | Antidegradation Allocations | | | | Most Limiting Allocations | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (ug/l unless noted) | Conc. | Acute | Chronic | HH (PWS) | HH | Acute | Chronic | HH (PWS) | HH | Acute | Chronic | HH (PWS) | HH | Acute | Chronic | HH (PWS) | HH | Acute | Chronic | HH (PWS) | HH |
| Ethylbenzene | 0 | -- | -- | 5.3E+02 | 2.1E+03 | -- | -- | 5.3E+02 | 2.1E+03 | -- | -- | 5.3E+01 | 2.1E+02 | -- | -- | 5.3E+01 | 2.1E+02 | -- | -- | **5.3E+01** | **2.1E+02** |
| Fluoranthene | 0 | -- | -- | 1.3E+02 | 1.4E+02 | -- | -- | 1.3E+02 | 1.4E+02 | -- | -- | 1.3E+01 | 1.4E+01 | -- | -- | 1.3E+01 | 1.4E+01 | -- | -- | **1.3E+01** | **1.4E+01** |
| Fluorene | 0 | -- | -- | 1.1E+03 | 5.3E+03 | -- | -- | 1.1E+03 | 5.3E+03 | -- | -- | 1.1E+02 | 5.3E+02 | -- | -- | 1.1E+02 | 5.3E+02 | -- | -- | **1.1E+02** | **5.3E+02** |
| Foaming Agents | 0 | -- | -- | 5.0E+02 | -- | -- | -- | 5.0E+02 | -- | -- | -- | 5.0E+01 | -- | -- | -- | 5.0E+01 | -- | -- | -- | **5.0E+01** | -- |
| Guthion | 0 | -- | 1.0E-02 | -- | -- | -- | 1.0E-02 | -- | -- | -- | 2.5E-03 | -- | -- | -- | 2.5E-03 | -- | -- | -- | **2.5E-03** | -- | -- |
| Heptachlor [C] | 0 | 5.2E-01 | 3.8E-03 | 7.9E-04 | 7.9E-04 | 5.2E-01 | 3.8E-03 | 7.9E-04 | 7.9E-04 | 1.3E-01 | 9.5E-04 | 7.9E-05 | 7.9E-05 | 1.3E-01 | 9.5E-04 | 7.9E-05 | 7.9E-05 | **1.3E-01** | **9.5E-04** | **7.9E-05** | **7.9E-05** |
| Heptachlor Epoxide[C] | 0 | 5.2E-01 | 3.8E-03 | 3.9E-04 | 3.9E-04 | 5.2E-01 | 3.8E-03 | 3.9E-04 | 3.9E-04 | 1.3E-01 | 9.5E-04 | 3.9E-05 | 3.9E-05 | 1.3E-01 | 9.5E-04 | 3.9E-05 | 3.9E-05 | **1.3E-01** | **9.5E-04** | **3.9E-05** | **3.9E-05** |
| Hexachlorobenzene[C] | 0 | -- | -- | 2.8E-03 | 2.9E-03 | -- | -- | 2.8E-03 | 2.9E-03 | -- | -- | 2.8E-04 | 2.9E-04 | -- | -- | 2.8E-04 | 2.9E-04 | -- | -- | **2.8E-04** | **2.9E-04** |
| Hexachlorobutadiene[C] | 0 | -- | -- | 4.4E+00 | 1.8E+02 | -- | -- | 4.4E+00 | 1.8E+02 | -- | -- | 4.4E-01 | 1.8E+01 | -- | -- | 4.4E-01 | 1.8E+01 | -- | -- | **4.4E-01** | **1.8E+01** |
| Hexachlorocyclohexane Alpha-BHC[C] | 0 | -- | -- | 2.6E-02 | 4.9E-02 | -- | -- | 2.6E-02 | 4.9E-02 | -- | -- | 2.6E-03 | 4.9E-03 | -- | -- | 2.6E-03 | 4.9E-03 | -- | -- | **2.6E-03** | **4.9E-03** |
| Hexachlorocyclohexane Beta-BHC[C] | 0 | -- | -- | 9.1E-02 | 1.7E-01 | -- | -- | 9.1E-02 | 1.7E-01 | -- | -- | 9.1E-03 | 1.7E-02 | -- | -- | 9.1E-03 | 1.7E-02 | -- | -- | **9.1E-03** | **1.7E-02** |
| Hexachlorocyclohexane Gamma-BHC[C] (Lindane) | 0 | 9.5E-01 | -- | 9.8E-01 | 1.8E+00 | 9.5E-01 | -- | 9.8E-01 | 1.8E+00 | 2.4E-01 | -- | 9.8E-02 | 1.8E-01 | 2.4E-01 | -- | 9.8E-02 | 1.8E-01 | **2.4E-01** | -- | **9.8E-02** | **1.8E-01** |
| Hexachlorocyclopentadiene | 0 | -- | -- | 4.0E+01 | 1.1E+03 | -- | -- | 4.0E+01 | 1.1E+03 | -- | -- | 4.0E+00 | 1.1E+02 | -- | -- | 4.0E+00 | 1.1E+02 | -- | -- | **4.0E+00** | **1.1E+02** |
| Hexachloroethane[C] | 0 | -- | -- | 1.4E+01 | 3.3E+01 | -- | -- | 1.4E+01 | 3.3E+01 | -- | -- | 1.4E+00 | 3.3E+00 | -- | -- | 1.4E+00 | 3.3E+00 | -- | -- | **1.4E+00** | **3.3E+00** |
| Hydrogen Sulfide | 0 | -- | 2.0E+00 | -- | -- | -- | 2.0E+00 | -- | -- | -- | 5.0E-01 | -- | -- | -- | 5.0E-01 | -- | -- | -- | **5.0E-01** | -- | -- |
| Indeno (1,2,3-cd) pyrene [C] | 0 | -- | -- | 3.8E-02 | 1.8E-01 | -- | -- | 3.8E-02 | 1.8E-01 | -- | -- | 3.8E-03 | 1.8E-02 | -- | -- | 3.8E-03 | 1.8E-02 | -- | -- | **3.8E-03** | **1.8E-02** |
| Iron | 0 | -- | -- | 3.0E+02 | -- | -- | -- | 3.0E+02 | -- | -- | -- | 3.0E+01 | -- | -- | -- | 3.0E+01 | -- | -- | -- | **3.0E+01** | -- |
| Isophorone[C] | 0 | -- | -- | 3.5E+02 | 9.6E+03 | -- | -- | 3.5E+02 | 9.6E+03 | -- | -- | 3.5E+01 | 9.6E+02 | -- | -- | 3.5E+01 | 9.6E+02 | -- | -- | **3.5E+01** | **9.6E+02** |
| Kepone | 0 | -- | 0.0E+00 | -- | -- | -- | 0.0E+00 | -- | -- | -- | 0.0E+00 | -- | -- | -- | 0.0E+00 | -- | -- | -- | **0.0E+00** | -- | -- |
| Lead | 0 | 4.9E+01 | 5.6E+00 | 1.5E+01 | -- | 4.9E+01 | 5.6E+00 | 1.5E+01 | -- | 1.2E+01 | 1.4E+00 | 1.5E+00 | -- | 1.2E+01 | 1.4E+00 | 1.5E+00 | -- | **1.2E+01** | **1.4E+00** | **1.5E+00** | -- |
| Malathion | 0 | -- | 1.0E-01 | -- | -- | -- | 1.0E-01 | -- | -- | -- | 2.5E-02 | -- | -- | -- | 2.5E-02 | -- | -- | -- | **2.5E-02** | -- | -- |
| Manganese | 0 | -- | -- | 5.0E+01 | -- | -- | -- | 5.0E+01 | -- | -- | -- | 5.0E+00 | -- | -- | -- | 5.0E+00 | -- | -- | -- | **5.0E+00** | -- |
| Mercury | 0 | 1.4E+00 | 7.7E-01 | -- | -- | 1.4E+00 | 7.7E-01 | -- | -- | 3.5E-01 | 1.9E-01 | -- | -- | 3.5E-01 | 1.9E-01 | -- | -- | **3.5E-01** | **1.9E-01** | -- | -- |
| Methyl Bromide | 0 | -- | -- | 4.7E+01 | 1.5E+03 | -- | -- | 4.7E+01 | 1.5E+03 | -- | -- | 4.7E+00 | 1.5E+02 | -- | -- | 4.7E+00 | 1.5E+02 | -- | -- | **4.7E+00** | **1.5E+02** |
| Methylene Chloride [C] | 0 | -- | -- | 4.6E+01 | 5.9E+03 | -- | -- | 4.6E+01 | 5.9E+03 | -- | -- | 4.6E+00 | 5.9E+02 | -- | -- | 4.6E+00 | 5.9E+02 | -- | -- | **4.6E+00** | **5.9E+02** |
| Methoxychlor | 0 | -- | 3.0E-02 | 1.0E+02 | -- | -- | 3.0E-02 | 1.0E+02 | -- | -- | 7.5E-03 | 1.0E+01 | -- | -- | 7.5E-03 | 1.0E+01 | -- | -- | **7.5E-03** | **1.0E+01** | -- |
| Mirex | 0 | -- | 0.0E+00 | -- | -- | -- | 0.0E+00 | -- | -- | -- | 0.0E+00 | -- | -- | -- | 0.0E+00 | -- | -- | -- | **0.0E+00** | -- | -- |
| Nickel | 0 | 1.0E+02 | 1.1E+01 | 6.1E+02 | 4.6E+03 | 1.0E+02 | 1.1E+01 | 6.1E+02 | 4.6E+03 | 2.5E+01 | 2.8E+00 | 6.1E+01 | 4.6E+02 | 2.5E+01 | 2.8E+00 | 6.1E+01 | 4.6E+02 | **2.5E+01** | **2.8E+00** | **6.1E+01** | **4.6E+02** |
| Nitrate (as N) | 0 | -- | -- | 1.0E+04 | -- | -- | -- | 1.0E+04 | -- | -- | -- | 1.0E+03 | -- | -- | -- | 1.0E+03 | -- | -- | -- | **1.0E+03** | -- |
| Nitrobenzene | 0 | -- | -- | 1.7E+01 | 6.9E+02 | -- | -- | 1.7E+01 | 6.9E+02 | -- | -- | 1.7E+00 | 6.9E+01 | -- | -- | 1.7E+00 | 6.9E+01 | -- | -- | **1.7E+00** | **6.9E+01** |
| N-Nitrosodimethylamine[C] | 0 | -- | -- | 6.9E-03 | 3.0E+01 | -- | -- | 6.9E-03 | 3.0E+01 | -- | -- | 6.9E-04 | 3.0E+00 | -- | -- | 6.9E-04 | 3.0E+00 | -- | -- | **6.9E-04** | **3.0E+00** |
| N-Nitrosodiphenylamine[C] | 0 | -- | -- | 3.3E+01 | 6.0E+01 | -- | -- | 3.3E+01 | 6.0E+01 | -- | -- | 3.3E+00 | 6.0E+00 | -- | -- | 3.3E+00 | 6.0E+00 | -- | -- | **3.3E+00** | **6.0E+00** |
| N-Nitrosodi-n-propylamine[C] | 0 | -- | -- | 5.0E-02 | 5.1E+00 | -- | -- | 5.0E-02 | 5.1E+00 | -- | -- | 5.0E-03 | 5.1E-01 | -- | -- | 5.0E-03 | 5.1E-01 | -- | -- | **5.0E-03** | **5.1E-01** |
| Nonylphenol | 0 | 2.8E+01 | 6.6E+00 | -- | -- | 2.8E+01 | 6.6E+00 | -- | -- | 7.0E+00 | 1.7E+00 | -- | -- | 7.0E+00 | 1.7E+00 | -- | -- | **7.0E+00** | **1.7E+00** | -- | -- |
| Parathion | 0 | 6.5E-02 | 1.3E-02 | -- | -- | 6.5E-02 | 1.3E-02 | -- | -- | 1.6E-02 | 3.3E-03 | -- | -- | 1.6E-02 | 3.3E-03 | -- | -- | **1.6E-02** | **3.3E-03** | -- | -- |
| PCB Total[C] | 0 | -- | 1.4E-02 | 6.4E-04 | 6.4E-04 | -- | 1.4E-02 | 6.4E-04 | 6.4E-04 | -- | 3.5E-03 | 6.4E-05 | 6.4E-05 | -- | 3.5E-03 | 6.4E-05 | 6.4E-05 | -- | **3.5E-03** | **6.4E-05** | **6.4E-05** |
| Pentachlorophenol [C] | 0 | 7.7E-03 | 5.9E-03 | 2.7E+00 | 3.0E+01 | 7.7E-03 | 5.9E-03 | 2.7E+00 | 3.0E+01 | 1.9E-03 | 1.5E-03 | 2.7E-01 | 3.0E+00 | 1.9E-03 | 1.5E-03 | 2.7E-01 | 3.0E+00 | **1.9E-03** | **1.5E-03** | **2.7E-01** | **3.0E+00** |
| Phenol | 0 | -- | -- | 1.0E+04 | 8.6E+05 | -- | -- | 1.0E+04 | 8.6E+05 | -- | -- | 1.0E+03 | 8.6E+04 | -- | -- | 1.0E+03 | 8.6E+04 | -- | -- | **1.0E+03** | **8.6E+04** |
| Pyrene | 0 | -- | -- | 8.3E+02 | 4.0E+03 | -- | -- | 8.3E+02 | 4.0E+03 | -- | -- | 8.3E+01 | 4.0E+02 | -- | -- | 8.3E+01 | 4.0E+02 | -- | -- | **8.3E+01** | **4.0E+02** |
| Radionuclides | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Gross Alpha Activity (pCi/L) | 0 | -- | -- | 1.5E+01 | -- | -- | -- | 1.5E+01 | -- | -- | -- | 1.5E+00 | -- | -- | -- | 1.5E+00 | -- | -- | -- | **1.5E+00** | -- |
| Beta and Photon Activity (mrem/yr) | 0 | -- | -- | 4.0E+00 | -- | -- | -- | 4.0E+00 | -- | -- | -- | 4.0E-01 | -- | -- | -- | 4.0E-01 | -- | -- | -- | **4.0E-01** | -- |
| Radium 226 + 228 (pCi/L) | 0 | -- | -- | 5.0E+00 | -- | -- | -- | 5.0E+00 | -- | -- | -- | 5.0E-01 | -- | -- | -- | 5.0E-01 | -- | -- | -- | **5.0E-01** | -- |
| Uranium (ug/l) | 0 | -- | -- | 3.0E+01 | -- | -- | -- | 3.0E+01 | -- | -- | -- | 3.0E+00 | -- | -- | -- | 3.0E+00 | -- | -- | -- | **3.0E+00** | -- |

| Parameter | Background | Water Quality Criteria | | | | Wasteload Allocations | | | | Antidegradation Baseline | | | | Antidegradation Allocations | | | | Most Limiting Allocations | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (ug/l unless noted) | Conc. | Acute | Chronic | HH (PWS) | HH | Acute | Chronic | HH (PWS) | HH | Acute | Chronic | HH (PWS) | HH | Acute | Chronic | HH (PWS) | HH | **Acute** | **Chronic** | **HH (PWS)** | **HH** |
| Selenium, Total Recoverable | 0 | 2.0E+01 | 5.0E+00 | 1.7E+02 | 4.2E+03 | 2.0E+01 | 5.0E+00 | 1.7E+02 | 4.2E+03 | 5.0E+00 | 1.3E+00 | 1.7E+01 | 4.2E+02 | 5.0E+00 | 1.3E+00 | 1.7E+01 | 4.2E+02 | **5.0E+00** | **1.3E+00** | **1.7E+01** | **4.2E+02** |
| Silver | 0 | 1.0E+00 | -- | -- | -- | 1.0E+00 | -- | -- | -- | 2.6E-01 | -- | -- | -- | 2.6E-01 | -- | -- | -- | **2.6E-01** | -- | -- | -- |
| Sulfate | 0 | -- | -- | 2.5E+05 | -- | -- | -- | 2.5E+05 | -- | -- | -- | 2.5E+04 | -- | -- | -- | 2.5E+04 | -- | -- | -- | **2.5E+04** | -- |
| 1,1,2,2-Tetrachloroethane[C] | 0 | -- | -- | 1.7E+00 | 4.0E+01 | -- | -- | 1.7E+00 | 4.0E+01 | -- | -- | 1.7E-01 | 4.0E+00 | -- | -- | 1.7E-01 | 4.0E+00 | -- | -- | **1.7E-01** | **4.0E+00** |
| Tetrachloroethylene[C] | 0 | -- | -- | 6.9E+00 | 3.3E+01 | -- | -- | 6.9E+00 | 3.3E+01 | -- | -- | 6.9E-01 | 3.3E+00 | -- | -- | 6.9E-01 | 3.3E+00 | -- | -- | **6.9E-01** | **3.3E+00** |
| Thallium | 0 | -- | -- | 2.4E-01 | 4.7E-01 | -- | -- | 2.4E-01 | 4.7E-01 | -- | -- | 2.4E-02 | 4.7E-02 | -- | -- | 2.4E-02 | 4.7E-02 | -- | -- | **2.4E-02** | **4.7E-02** |
| Toluene | 0 | -- | -- | 5.1E+02 | 6.0E+03 | -- | -- | 5.1E+02 | 6.0E+03 | -- | -- | 5.1E+01 | 6.0E+02 | -- | -- | 5.1E+01 | 6.0E+02 | -- | -- | **5.1E+01** | **6.0E+02** |
| Total dissolved solids | 0 | -- | -- | 5.0E+05 | -- | -- | -- | 5.0E+05 | -- | -- | -- | 5.0E+04 | -- | -- | -- | 5.0E+04 | -- | -- | -- | **5.0E+04** | -- |
| Toxaphene [C] | 0 | 7.3E-01 | 2.0E-04 | 2.8E-03 | 2.8E-03 | 7.3E-01 | 2.0E-04 | 2.8E-03 | 2.8E-03 | 1.8E-01 | 5.0E-05 | 2.8E-04 | 2.8E-04 | 1.8E-01 | 5.0E-05 | 2.8E-04 | 2.8E-04 | **1.8E-01** | **5.0E-05** | **2.8E-04** | **2.8E-04** |
| Tributyltin | 0 | 4.6E-01 | 7.2E-02 | -- | -- | 4.6E-01 | 7.2E-02 | -- | -- | 1.2E-01 | 1.8E-02 | -- | -- | 1.2E-01 | 1.8E-02 | -- | -- | **1.2E-01** | **1.8E-02** | -- | -- |
| 1,2,4-Trichlorobenzene | 0 | -- | -- | 3.5E+01 | 7.0E+01 | -- | -- | 3.5E+01 | 7.0E+01 | -- | -- | 3.5E+00 | 7.0E+00 | -- | -- | 3.5E+00 | 7.0E+00 | -- | -- | **3.5E+00** | **7.0E+00** |
| 1,1,2-Trichloroethane[C] | 0 | -- | -- | 5.9E+00 | 1.6E+02 | -- | -- | 5.9E+00 | 1.6E+02 | -- | -- | 5.9E-01 | 1.6E+01 | -- | -- | 5.9E-01 | 1.6E+01 | -- | -- | **5.9E-01** | **1.6E+01** |
| Trichloroethylene [C] | 0 | -- | -- | 2.5E+01 | 3.0E+02 | -- | -- | 2.5E+01 | 3.0E+02 | -- | -- | 2.5E+00 | 3.0E+01 | -- | -- | 2.5E+00 | 3.0E+01 | -- | -- | **2.5E+00** | **3.0E+01** |
| 2,4,6-Trichlorophenol [C] | 0 | -- | -- | 1.4E+01 | 2.4E+01 | -- | -- | 1.4E+01 | 2.4E+01 | -- | -- | 1.4E+00 | 2.4E+00 | -- | -- | 1.4E+00 | 2.4E+00 | -- | -- | **1.4E+00** | **2.4E+00** |
| 2-(2,4,5-Trichlorophenoxy) propionic acid (Silvex) | 0 | -- | -- | 5.0E+01 | -- | -- | -- | 5.0E+01 | -- | -- | -- | 5.0E+00 | -- | -- | -- | 5.0E+00 | -- | -- | -- | **5.0E+00** | -- |
| Vinyl Chloride[C] | 0 | -- | -- | 2.5E-01 | 2.4E+01 | -- | -- | 2.5E-01 | 2.4E+01 | -- | -- | 2.5E-02 | 2.4E+00 | -- | -- | 2.5E-02 | 2.4E+00 | -- | -- | **2.5E-02** | **2.4E+00** |
| Zinc | 0 | 6.5E+01 | 6.6E+01 | 7.4E+03 | 2.6E+04 | 6.5E+01 | 6.6E+01 | 7.4E+03 | 2.6E+04 | 1.6E+01 | 1.6E+01 | 7.4E+02 | 2.6E+03 | 1.6E+01 | 1.6E+01 | 7.4E+02 | 2.6E+03 | **1.6E+01** | **1.6E+01** | **7.4E+02** | **2.6E+03** |

Notes:

1. All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise
2. Discharge flow is highest monthly average or Form 2C maximum for Industries and design flow for Municipals
3. Metals measured as Dissolved, unless specified otherwise
4. "C" indicates a carcinogenic parameter
5. Regular WLAs are mass balances (minus background concentration) using the % of stream flow entered above under Mixing Information.
   Antidegradation WLAs are based upon a complete mix.
6. Antideg. Baseline = (0.25(WQC - background conc.) + background conc.) for acute and chronic
   = (0.1(WQC - background conc.) + background conc.) for human health
7. WLAs established at the following stream flows: 1Q10 for Acute, 30Q10 for Chronic Ammonia, 7Q10 for Other Chronic, 30Q5 for Non-carcinogens and Harmonic Mean for Carcinogens. To apply mixing ratios from a model set the stream flow equal to (mixing ratio - 1), effluent flow equal to 1 and 100% mix.

| Metal | Target Value (SSTV) |
|---|---|
| Antimony | 5.6E-01 |
| Arsenic | 1.0E+00 |
| Barium | 2.0E+02 |
| Cadmium | 9.9E-02 |
| Chromium III | 6.3E+00 |
| Chromium VI | 1.6E+00 |
| Copper | 7.0E-01 |
| Iron | 3.0E+01 |
| Lead | 8.4E-01 |
| Manganese | 5.0E+00 |
| Mercury | 1.2E-01 |
| Nickel | 1.7E+00 |
| Selenium | 7.5E-01 |
| Silver | 1.0E-01 |
| Zinc | 6.5E+00 |

Note: do not use QL's lower than the minimum QL's provided in agency guidance

**VaFWIS - Department of Game and Inland Fisheries**

39,02,52.0 -77,32,00.0
**is the Search Point**
Submit Cancel

**Search Point**
◉ **Change** to "clicked" map point
○ **Fixed** at 39,02,52.0 - 77,32,00.0

**Show Position Rings**
◉ Yes ○ No
1 mile and 1/4 mile at the **Search Point**

**Show Search Area**
◉ Yes ○ No
2 Search distance miles radius

**Search Point** is at map center

**Base Map** Choices
Topography

**Map Overlay** Choices
Current List: Position, Search

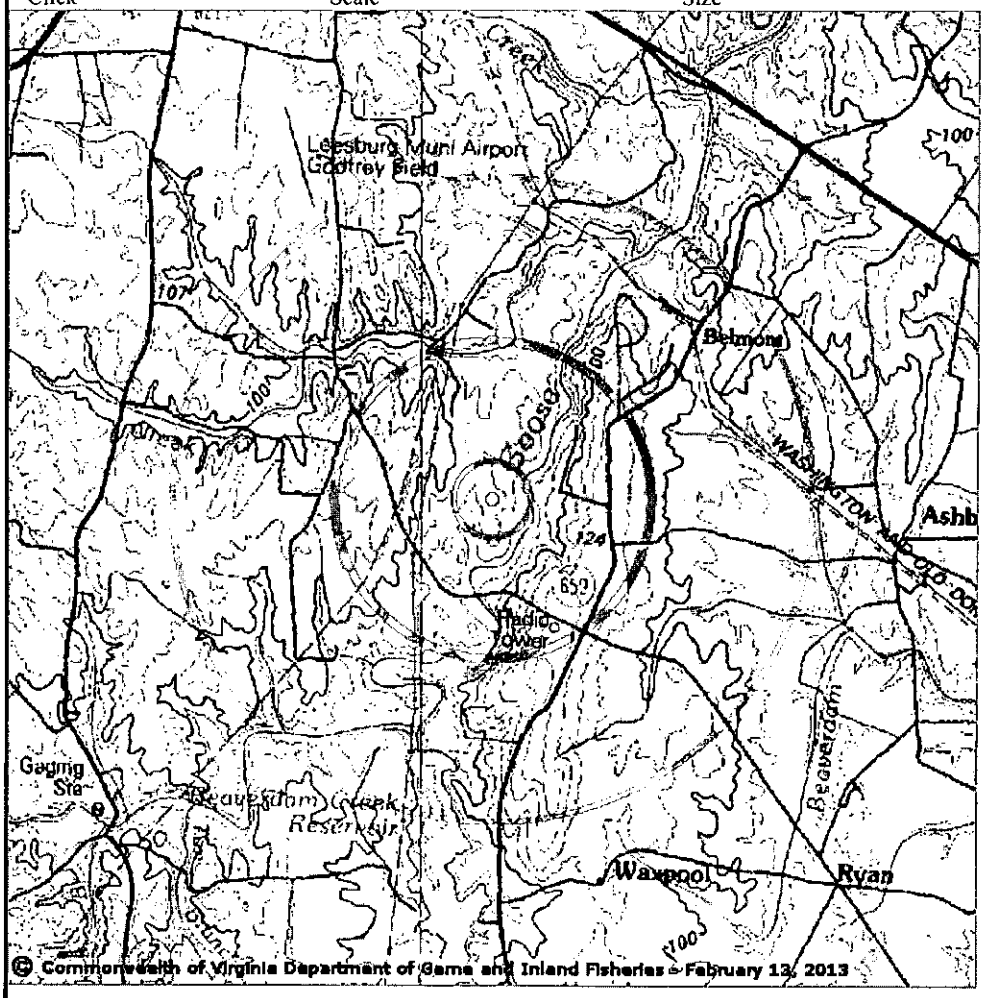
**Map Overlay Legend**

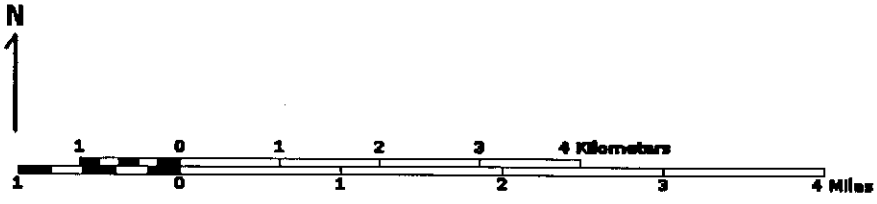
**Position Rings**
**1 mile and 1/4 mile at the Search Point**

**2 mile radius Search Area**

Refresh Browser Page

Map Click Pan | Map Scale In Zoom Out | Screen Size Small Size Big




Point of Search 39,02,52.0 -77,32,00.0
Map Location 39,02,52.0 -77,32,00.0

Select **Coordinate System:** ◉ Degrees,Minutes,Seconds Latitude - Longitude
○ Decimal Degrees Latitude - Longitude
○ Meters UTM NAD83 East North Zone
○ Meters UTM NAD27 East North Zone

Base Map source: USGS 1:100,000 topographic maps (see Microsoft terraserver-usa.com for details)

Map projection is UTM Zone 18 NAD 1983 with left 275969 and top 4329933. Pixel size is 16 meters . Coordinates displayed are Degrees, Minutes, Seconds North and West.Map is currently displayed as 600 columns by 600 rows for a total of 360000 pixles. The map display represents

Attachment 7

9600 meters east to west by 9600 meters north to south for a total of 92.1 square kilometers. The map display represents 31501 feet east to west by 31501 feet north to south for a total of 35.5 square miles.

Topographic maps and Black and white aerial photography for year 1990+-
are from the United States Department of the Interior, United States Geological Survey.
Color aerial photography aquired 2002 is from Virginia Base Mapping Program, Virginia Geographic Information Network.
Shaded topographic maps are from TOPO! ©2006 National Geographic
http://www.national.geographic.com/topo
All other map products are from the Commonwealth of Virginia Department of Game and Inland Fisheries.

map assembled 2013-02-13 11:10:12 (qa/qc December 5, 2012 8:04 - tn=446409 dist=3218 1)
$poi=39.0477777 -77.5333333

**VaFWIS Initial Project Assessment Report** Compiled on 2/13/2013, 11:11:10 AM

Help

Known or likely to occur within a **2 mile radius around point 39,02,52.0 77,32,00.0** in **107 Loudoun County, VA**

View Map of Site Location

442 Known or Likely Species ordered by Status Concern for Conservation
(displaying first 20) (20 species with Status* or Tier I** or Tier II** )

| BOVA Code | Status* | Tier** | Common Name | Scientific Name | Confirmed | Database(s) |
|---|---|---|---|---|---|---|
| 030062 | ST | I | Turtle, wood | Glyptemys insculpta | | BOVA,Habitat |
| 040129 | ST | I | Sandpiper, upland | Bartramia longicauda | | BOVA |
| 040293 | ST | I | Shrike, loggerhead | Lanius ludovicianus | | BOVA |
| 040379 | ST | I | Sparrow, Henslow's | Ammodramus henslowii | | BOVA |
| 060081 | ST | II | Floater, green | Lasmigona subviridis | Yes | BOVA,TEWaters,Habitat |
| 040292 | ST | | Shrike, migrant loggerhead | Lanius ludovicianus migrans | | BOVA |
| 100248 | FS | I | Fritillary, regal | Speyeria idalia idalia | | BOVA |
| 040093 | FS | II | Eagle, bald | Haliaeetus leucocephalus | | BOVA |
| 100166 | FS | II | Skipper, Dotted | Hesperia attalus slossonae | | BOVA |
| 030063 | CC | III | Turtle, spotted | Clemmys guttata | | BOVA |

| | | | | | | |
|---|---|---|---|---|---|---|
| 030012 | CC | IV | Rattlesnake, timber | Crotalus horridus | | BOVA |
| 040372 | | I | Crossbill, red | Loxia curvirostra | | BOVA |
| 040225 | | I | Sapsucker, yellow-bellied | Sphyrapicus varius | | BOVA |
| 040319 | | I | Warbler, black-throated green | Dendroica virens | | BOVA |
| 040306 | | I | Warbler, golden-winged | Vermivora chrysoptera | | BOVA |
| 040052 | | II | Duck, American black | Anas rubripes | | BOVA |
| 040213 | | II | Owl, northern saw-whet | Aegolius acadicus | | BOVA |
| 040105 | | II | Rail, king | Rallus elegans | | BOVA |
| 040320 | | II | Warbler, cerulean | Dendroica cerulea | | BOVA |
| 040266 | | II | Wren, winter | Troglodytes troglodytes | | BOVA |

To view **All 442 species** View 442

* FE=Federal Endangered; FT=Federal Threatened; SE=State Endangered; ST=State Threatened; FP=Federal Proposed; FC=Federal Candidate; FS=Federal Species of Concern; CC=Collection Concern

** I=VA Wildlife Action Plan - Tier I - Critical Conservation Need; II=VA Wildlife Action Plan - Tier II - Very High Conservation Need; III=VA Wildlife Action Plan - Tier III - High Conservation Need; IV=VA Wildlife Action Plan - Tier IV - Moderate Conservation Need

Bat Colonies or Hibernacula: **Not Known**

**Anadromous Fish Use Streams**

N/A

**Colonial Water Bird Survey**

N/A

**Threatened and Endangered Waters** ( 1 Reach ) View Map of All Threatened and Endangered Waters

| Stream Name | T&E Waters Species | | | | | | View Map |
|---|---|---|---|---|---|---|---|
| | Highest TE* | BOVA Code | Status* | Tier** | Common & Scientific Name | | |
| Goose Creek (02070008) | ST | 060081 | ST | II | Floater, green | Lasmigona subviridis | Yes |

**Managed Trout Streams**

N/A

**Bald Eagle Concentration Areas and Roosts**

N/A

**Bald Eagle Nests**

N/A

**Habitat Predicted for Aquatic WAP Tier I & II Species** ( 5 Reaches ) View Map Combined Reaches from Below of Habitat Predicted for WAP Tier I & II Aquatic Species

| Stream Name | Tier Species | | | | | | View Map |
|---|---|---|---|---|---|---|---|
| | Highest TE* | BOVA Code | Status* | Tier** | Common & Scientific Name | | |
| (20700081) | ST | 030062 | ST | I | Turtle, wood | Glyptemys insculpta | Yes |
| Beaverdam Creek (20700081) | ST | 030062 | ST | I | Turtle, wood | Glyptemys insculpta | Yes |
| Beaverdam Run (20700081) | ST | 030062 | ST | I | Turtle, wood | Glyptemys insculpta | Yes |
| Sycolin Creek (20700081) | ST | 030062 | ST | I | Turtle, wood | Glyptemys insculpta | Yes |
| Goose Creek (20700081) | ST | 060081 | ST | II | Floater, green | Lasmigona subviridis | Yes |

**Habitat Predicted for Terrestrial WAP Tier I & II Species**

N/A

**Public Holdings:**

N/A

Compiled on 2/13/2013, 11:11:10 AM 1446409.0 report=JPA searchType= R dist= 3218 pos= 39.02,-77.32,00.0

PixelSize=64, Anadromous=0.02366, DECAR=0.010294, Fish=0.031515, Buffer=0.184399, County=0.075128, Impediments=0.035575, Inst=0.220344, PublicLands=0.035103, SppObs=0.032186, TEWaters=0.063291, TierReaches=0.145434, TierTerrestrial=0.062332, Total=1.691955, Trout=0.035426



- Site tested using browsers Chrome 10+, Firefox 2+, IE 6+, Opera 9+, and Safari 4+ ( FWISWEB1 February 13, 2013 11:11:12AM northern I 446409 )
- W3C HTML validation <BASE href="https://fwisweb1.dgif.virginia.gov/fwis/NewPages/">VaFWIS_GeographicSelect_Options.asp

3/14/2013 1:50:17 PM

Facility = Loudoun WTP
Chemical = Total Residual Chlorine
Chronic averaging period = 4
WLAa = 4.8
WLAc = 2.8
Q.L. = 100
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

# observations = 1
Expected Value = 200
Variance = 14400
C.V. = 0.6
97th percentile daily values = 486.683
97th percentile 4 day average = 332.758
97th percentile 30 day average= 241.210
# < Q.L. = 0
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Chronic Toxicity
Maximum Daily Limit = 4.09520939534905
Average Weekly limit = 4.09520939534905
Average Monthly LImit = 4.09520939534905

The data are:

200

Public Notice – Environmental Permit

PURPOSE OF NOTICE: To seek public comment on a draft permit from the Department of Environmental Quality that will allow the release of treated wastewater into a water body in Loudoun County, Virginia.

PUBLIC COMMENT PERIOD: August 21, 2013 to September 21, 2013

PERMIT NAME: Virginia Pollutant Discharge Elimination System Permit – Wastewater issued by DEQ, under the authority of the State Water Control Board

APPLICANT NAME, ADDRESS AND PERMIT NUMBER: Loudoun Water, 44865 Loudoun Water Way, PO Box 4000, Ashburn, VA 20146, VA0092754

NAME AND ADDRESS OF FACILITY: Loudoun Water Treatment Plant (WTP), Parcel of land is west and adjacent to the Goose Creek Reservoir and on the north side of the Dulles Greenway

PROJECT DESCRIPTION: Loudoun Water has applied for a new issuance of a permit for the public Loudoun WTP. The applicant proposes to release treated industrial wastewaters from the production of potable water at an average rate of 0.033 million gallons per day into a water body. The facility proposes to release the treated industrial wastewaters in an unnamed tributary to the Goose Creek Reservoir in Loudoun County in the Potomac watershed. A watershed is the land area drained by a river and its incoming streams. The permit will limit the following pollutants to amounts that protect water quality: pH, Total Suspended Solids, and Total Residual Chlorine. The facility will also monitor for Whole Effluent Toxicity.

HOW TO COMMENT AND/OR REQUEST A PUBLIC HEARING: DEQ accepts comments and requests for public hearing by hand-delivery, e-mail, fax or postal mail. All comments and requests must be in writing and be received by DEQ during the comment period. Submittals must include the names, mailing addresses and telephone numbers of the commenter/requester and of all persons represented by the commenter/requester. A request for public hearing must also include: 1) The reason why a public hearing is requested. 2) A brief, informal statement regarding the nature and extent of the interest of the requester or of those represented by the requester, including how and to what extent such interest would be directly and adversely affected by the permit. 3) Specific references, where possible, to terms and conditions of the permit with suggested revisions. A public hearing may be held, including another comment period, if public response is significant, based on individual requests for a public hearing, and there are substantial, disputed issues relevant to the permit.

CONTACT FOR PUBLIC COMMENTS, DOCUMENT REQUESTS AND ADDITIONAL INFORMATION: The public may review the draft permit and application at the DEQ-Northern Regional Office by appointment, or may request electronic copies of the draft permit and fact sheet.
Name: Alison Thompson
Address: DEQ-Northern Regional Office, 13901 Crown Court, Woodbridge, VA 22193
Phone: (703) 583-3834 E-mail: Alison.Thompson@deq.virginia.gov Fax: (703) 583-3821

Revised 2/2003

***State "Transmittal Checklist" to Assist in Targeting***
***Municipal and Industrial Individual NPDES Draft Permits for Review***

**Part I. State Draft Permit Submission Checklist**

In accordance with the MOA established between the Commonwealth of Virginia and the United States Environmental Protection Agency, Region III, the Commonwealth submits the following draft National Pollutant Discharge Elimination System (NPDES) permit for Agency review and concurrence.

| | |
|---|---|
| Facility Name: | Loudoun WTP |
| NPDES Permit Number: | VA0092754 |
| Permit Writer Name: | Alison Thompson |
| Date: | March 28, 2013 |

**Major [ ]** **Minor [X]** **Industrial [X]** **Municipal [ ]**

| **I.A. Draft Permit Package Submittal Includes:** | **Yes** | **No** | **N/A** |
|---|---|---|---|
| 1. Permit Application? | X | | |
| 2. Complete Draft Permit (for renewal or first time permit – entire permit, including boilerplate information)? | X | | |
| 3. Copy of Public Notice? | X | | |
| 4. Complete Fact Sheet? | X | | |
| 5. A Priority Pollutant Screening to determine parameters of concern? Unbuilt facility | | X | |
| 6. A Reasonable Potential analysis showing calculated WQBELs? | X | | |
| 7. Dissolved Oxygen calculations? | | | X |
| 8. Whole Effluent Toxicity Test summary and analysis? Unbuilt facility | | X | |
| 9. Permit Rating Sheet for new or modified industrial facilities? | X | | |

| **I.B. Permit/Facility Characteristics** | **Yes** | **No** | **N/A** |
|---|---|---|---|
| 1. Is this a new, or currently unpermitted facility? | X | | |
| 2. Are all permissible outfalls (including combined sewer overflow points, non-process water and storm water) from the facility properly identified and authorized in the permit? | X | | |
| 3. Does the fact sheet or permit contain a description of the wastewater treatment process? | X | | |
| 4. Does the review of PCS/DMR data for at least the last 3 years indicate significant non-compliance with the existing permit? | | | X |
| 5. Has there been any change in streamflow characteristics since the last permit was developed? | | | X |
| 6. Does the permit allow the discharge of new or increased loadings of any pollutants? | X | | |
| 7. Does the fact sheet or permit provide a description of the receiving water body(s) to which the facility discharges, including information on low/critical flow conditions and designated/existing uses? | X | | |
| 8. Does the facility discharge to a 303(d) listed water? | X | | |
| a. Has a TMDL been developed and approved by EPA for the impaired water? | X | | |
| b. Does the record indicate that the TMDL development is on the State priority list and will most likely be developed within the life of the permit? | | | X |
| c. Does the facility discharge a pollutant of concern identified in the TMDL or 303(d) listed water? | X | | |
| 9. Have any limits been removed, or are any limits less stringent, than those in the current permit? | | | X |
| 10. Does the permit authorize discharges of storm water? | | X | |
| | | | |

| I.B. Permit/Facility Characteristics – cont. | Yes | No | N/A |
|---|---|---|---|
| 11. Has the facility substantially enlarged or altered its operation or substantially increased its flow or production? | | | X |
| 12. Are there any production-based, technology-based effluent limits in the permit? | | | X |
| 13. Do any water quality-based effluent limit calculations differ from the State's standard policies or procedures? | | X | |
| 14. Are any WQBELs based on an interpretation of narrative criteria? | | X | |
| 15. Does the permit incorporate any variances or other exceptions to the State's standards or regulations? | | X | |
| 16. Does the permit contain a compliance schedule for any limit or condition? | | X | |
| 17. Is there a potential impact to endangered/threatened species or their habitat by the facility's discharge(s)? | | X | |
| 18. Have impacts from the discharge(s) at downstream potable water supplies been evaluated? | X | | |
| 19. Is there any indication that there is significant public interest in the permit action proposed for this facility? | | X | |
| 20. Have previous permit, application, and fact sheet been examined? | | | X |

**Part II. NPDES Draft Permit Checklist**

**Region III NPDES Permit Quality Review Checklist – For Non-Municipals**
*(To be completed and included in the record for all non-POTWs)*

| II.A. Permit Cover Page/Administration | Yes | No | N/A |
|---|---|---|---|
| 1. Does the fact sheet or permit describe the physical location of the facility, including latitude and longitude (not necessarily on permit cover page)? | X | | |
| 2. Does the permit contain specific authorization-to-discharge information (from where to where, by whom)? | X | | |

| II.B. Effluent Limits – General Elements | Yes | No | N/A |
|---|---|---|---|
| 1. Does the fact sheet describe the basis of final limits in the permit (e.g., that a comparison of technology and water quality-based limits was performed, and the most stringent limit selected)? | X | | |
| 2. Does the fact sheet discuss whether "antibacksliding" provisions were met for any limits that are less stringent than those in the previous NPDES permit? | X | | |

| II.C. Technology-Based Effluent Limits (Effluent Guidelines & BPJ) | Yes | No | N/A |
|---|---|---|---|
| 1. Is the facility subject to a national effluent limitations guideline (ELG)? | | X | |
| a. If yes, does the record adequately document the categorization process, including an evaluation of whether the facility is a new source or an existing source? | | | X |
| b. If no, does the record indicate that a technology-based analysis based on Best Professional Judgement (BPJ) was used for all pollutants of concern discharged at treatable concentrations? | | | X |
| 2. For all limits developed based on BPJ, does the record indicate that the limits are consistent with the criteria established at 40 CFR 125.3(d)? | X | | |
| 3. Does the fact sheet adequately document the calculations used to develop both ELG and /or BPJ technology-based effluent limits? | X | | |
| 4. For all limits that are based on production or flow, does the record indicate that the calculations are based on a "reasonable measure of ACTUAL production" for the facility (not design)? | X | | |
| 5. Does the permit contain "tiered" limits that reflect projected increases in production or flow? | | X | |
| a. If yes, does the permit require the facility to notify the permitting authority when alternate levels of production or flow are attained? | | | X |
| 6. Are technology-based permit limits expressed in appropriate units of measure (e.g., concentration, mass, SU)? | X | | |
| 7. Are all technology-based limits expressed in terms of both maximum daily, weekly average, and/or monthly average limits? | X | | |
| 8. Are any final limits less stringent than required by applicable effluent limitations guidelines or BPJ? | | X | |

| II.D. Water Quality-Based Effluent Limits | Yes | No | N/A |
|---|---|---|---|
| 1. Does the permit include appropriate limitations consistent with 40 CFR 122.44(d) covering State narrative and numeric criteria for water quality? | X | | |
| 2. Does the record indicate that any WQBELs were derived from a completed and EPA approved TMDL? | X | | |
| 3. Does the fact sheet provide effluent characteristics for each outfall? | X | | |
| 4. Does the fact sheet document that a "reasonable potential" evaluation was performed? | X | | |
| a. If yes, does the fact sheet indicate that the "reasonable potential" evaluation was performed in accordance with the State's approved procedures? | X | | |
| b. Does the fact sheet describe the basis for allowing or disallowing in-stream dilution or a mixing zone? | X | | |

| II.D. Water Quality-Based Effluent Limits – cont. | Yes | No | N/A |
|---|---|---|---|
| c. Does the fact sheet present WLA calculation procedures for all pollutants that were found to have "reasonable potential"? | X | | |
| d. Does the fact sheet indicate that the "reasonable potential" and WLA calculations accounted for contributions from upstream sources (i.e., do calculations include ambient/background concentrations where data are available)? | X | | |
| e. Does the permit contain numeric effluent limits for all pollutants for which "reasonable potential" was determined? | X | | |
| 5. Are all final WQBELs in the permit consistent with the justification and/or documentation provided in the fact sheet? | X | | |
| 6. For all final WQBELs, are BOTH long-term (e.g., average monthly) AND short-term (e.g., maximum daily, weekly average, instantaneous) effluent limits established? | X | | |
| 7. Are WQBELs expressed in the permit using appropriate units of measure (e.g., mass, concentration)? | X | | |
| 8. Does the fact sheet indicate that an "antidegradation" review was performed in accordance with the State's approved antidegradation policy? | X | | |

| II.E. Monitoring and Reporting Requirements | Yes | No | N/A |
|---|---|---|---|
| 1. Does the permit require at least annual monitoring for all limited parameters? | X | | |
| a. If no, does the fact sheet indicate that the facility applied for and was granted a monitoring waiver, AND, does the permit specifically incorporate this waiver? | | | X |
| 2. Does the permit identify the physical location where monitoring is to be performed for each outfall? | X | | |
| 3. Does the permit require testing for Whole Effluent Toxicity in accordance with the State's standard practices? | X | | |

| II.F. Special Conditions | Yes | No | N/A |
|---|---|---|---|
| 1. Does the permit require development and implementation of a Best Management Practices (BMP) plan or site-specific BMPs? | | X | |
| a. If yes, does the permit adequately incorporate and require compliance with the BMPs? | | | X |
| 2. If the permit contains compliance schedule(s), are they consistent with statutory and regulatory deadlines and requirements? | | | X |
| 3. Are other special conditions (e.g., ambient sampling, mixing studies, TIE/TRE, BMPs, special studies) consistent with CWA and NPDES regulations? | X | | |

| II.G. Standard Conditions | Yes | No | N/A |
|---|---|---|---|
| 1. Does the **permit** contain all 40 CFR 122.41 standard conditions or the State equivalent (or more stringent) conditions? | X | | |

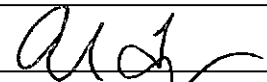
**List of Standard Conditions – 40 CFR 122.41**

| | | |
|---|---|---|
| Duty to comply | Property rights | Reporting Requirements |
| Duty to reapply | Duty to provide information | Planned change |
| Need to halt or reduce activity | Inspections and entry | Anticipated noncompliance |
| not a defense | Monitoring and records | Transfers |
| Duty to mitigate | Signatory requirement | Monitoring reports |
| Proper O & M | Bypass | Compliance schedules |
| Permit actions | Upset | 24-Hour reporting |
| | | Other non-compliance |

| | | | |
|---|---|---|---|
| 2. Does the permit contain the additional standard condition (or the State equivalent or more stringent conditions) for existing non-municipal dischargers regarding pollutant notification levels [40 CFR 122.42(a)]? | X | | |

**Part III. Signature Page**

Based on a review of the data and other information submitted by the permit applicant, and the draft permit and other administrative records generated by the Department/Division and/or made available to the Department/Division, the information provided on this checklist is accurate and complete, to the best of my knowledge.

| | |
|---|---|
| Name | Alison Thompson |
| Title | Water Permits Technical Reviewer |
| Signature |  |
| Date | 9/1/13 |